UNIV. OF
TORONTO
LIBRARY

DEPARTMENT OF MINING ENGINEERING
Library Number: 1586
Return this book to
Cupboard: M.
Shelf: 3

All books are to be signed for in the loan book when borrowed, and when returned.

Books must be returned within One Week, unless special permission is given for a longer loan.

Digitized by the Internet Archive
in 2010 with funding from
University of Toronto

http://www.archive.org/details/miningcongressjo02amer

M

ALPHABETICAL INDEX
FOR
VOLUME II
MINING CONGRESS JOURNAL

140407
17/1/17

A

Accident form.... 154
Accounting, Uniform.... 160
Aetna chemical plant (cut).... 132
After the War.... 98
Alabama mine safety work.... 311
Aluminum, new uses.... 135
Alaska to Uncle Sam (poem).... 122
Alaska—editorial.... 29
  mines report.... 220
  agriculture.... 133
  Severe winter in.... 204
  summer's work successful.... 502
  Yukon trip.... 372
  coal leasing.... 270
  mining in 1916.... 310
  metal output.... 384
American Mining Congress, Bureau of Mining Economics.... 273
  convention.... 365, 393, 429, 472
  History (with cuts).... 481
  Offices.... 489
  Arizona exhibit.... 501
  American Institute meeting.... 497
Anaconda Commission meets.... 107
Anthracite Map.... 94
  strike.... 307
  used in many States.... 490
  Production of.... 496
  Use of machines.... 513
Anticlinical theory.... 522, 526
Antimony, zinc content.... 272
  treatment.... 122
  prices.... 93
Apex law.... 363
  condemned.... 394
  opinion by Knight.... 314
  in Philippines.... 68
Appropriations, U. S. G. S.... 120
  hog cholera.... 131
Arizona, asbestos mining.... 327
  mineral output.... 322
  copper production.... 418
  New ore bodies.... 63
  Chapter meeting.... 20
Arkansas "lakes".... 120
Arsenic, chance for profit.... 120
Asbestos production.... 327
  in Georgia.... 307
  Arizona output.... 149

B

Ball, Max W.... 535
  promoted.... 173
  (cut).... 403
Bastin, E. S. (cut).... 176
Barium mines visited.... 276
Bauxite in Georgia.... 208
Big Horn basin report.... 114
Birdseye narrates adventure.... 75
Bishop, Roy A.... 536
Black Hills folio.... 76
Blast furnace practice.... 519
Bolivian tin.... 73
Branner, Dr. J. C., honored.... 124
Bristol district.... 436
Bully Hill smelter (cut).... 63
Bureau of Mining Economics.... 273
Bureau of Mines, Preparedness in.... 161
  and labor.... 117
  Safety First train.... 269
  concerning patents.... 307
  exhibit at Chicago.... 527
  scientific societies.... 536
  fire.... 131
  exhibit at chemical show.... 471
  saves oil industry $50,000,000.... 479
  rescue and recovery operations.... 491
  library.... 500
  official's life saved.... 501
  exhibit at Detroit.... 506
Burrell, Geo. A., sketch.... 361
Butler, B. S.... 233
Butte Sanitary Survey.... 275

C

California, hookworm in mines.... 304
  Safety Bear.... 274
  cooperation.... 176
  inspection.... 255
Callbreath, J. F. (cut).... 473, 534
Calumet and Hecla anniversary.... 366
Calumet leaching plant.... 249
Canal mineral tonnage.... 454
Carborundum materials.... 78
Car supply.... 421, 449
Castle Rock folio.... 151
Cement output.... 322
Chemical statistics.... 512
Cherry Creek district.... 440
Chromite, California.... 49, 122

Coal, Alaskan leasing.............. 270
  operators confer with Federal Trade commission................. 278
  wage scale...................... 119
  consumption statistics............ 181
  Strike Commission............... 174
  Future of....................... 351
  Railroad statistics............... 366
  Taxation system................. 382
  statistics....................168, 391
  safety costs.................... 550
  cooperation..................... 526
  waste in retailing................ 536
  Idle mines...................... 526
  Washing of...................... 528
  trade better..................... 530
  price regulation.................. 534
  Coking of....................... 535
  labor and price.................. 493
  Machines in mining.............. 494
  Ohio freight rates................ 480
  Shooting from solid.............. 489
  Kansas production............... 490
  competition with oil.............. 496
  strike increases stock............ 498
  Semi-bituminous................. 499
  Canadian competition............ 501
  in Oregon...................... 502
  in Tennessee.................... 502
  in Kentucky.................... 508
  selling at a loss................. 508
  strikes and production........... 512
  classifications.................. 513
  Electrification of C. M. & St. P.... 513
  in Iowa........................ 514
  case in Supreme Court........... 516
  elimination of refuse............ 519
  in Alabama..................... 517
  Combustion of.................. 233
  production slackens............. 129
  dust experiments................ 82
  explosibility.................... 169
  shipments...................... 427
  in Kentucky.................... 432
  in Virginia..................... 438
  tar dyes....................... 514
  lands suit...................... 225
Coke, in U. S. in 1915............. 397
  for heating..................... 392
  ovens, by-product............... 220
Colorado Metal Mining Association.. 136
Conservation Congress meets....117, 284
Cooperative selling agency.......... 506
Copper, matte case................ 344
  Nevado production.............. 316
  production..................... 311
  estimate on.................... 272
  tax on.....................349, 387
  in Germany.................... 122
  profits........................ 540
  smelters....................... 490
  advance in metallurgy........... 508
  California law.................. 508
  production..................... 511
  mines, deaths in................ 173
Cottrell, F. G.............281, 494, 530
Crews, Ralph (cut)................ 501
Crocoite......................... 262
Crosby, Geo. H................... 536
Cryolite......................... 281
Cushing, Geo..................... 540

D

Davis, Chas. A., dies.............. 226
Delegates appointed by president.... 475
Dering, C. L...................... 527
Detonators....................... 244
Devil's Tower..................... 62
Disease among miners............. 245
Dolly Varden district.............. 441
Douglas, Walter—editorial......480, 521
  Cartoon of..................... 527
Du Pont, protests against tax....... 376
Dynamite prices.................. 310

E

Editorials, Annual convention....... 287
  Cooperation.................... 287
  Trade Commission request........ 288
  Foster Bill..................... 288
  Appropriation cut................ 288
  Criminal waste.................. 289
  Alaskan Railway................ 289
  Armor plate.................... 290
  Mining Congress Journal......... 291
  Discrimination against mining.... 291
  Accident figures................ 292
  Sundry Civil Bill............... 293
  Tavenner Bill.................. 333
  Collective bargaining............ 334
  Trade and efficiency............. 334
  Markets....................... 335
  Government pay................ 335
  Tungsten prices................ 335
  Conservation................... 445
  Mine safety.................... 445
  Public lands................... 445
  Potash........................ 445
  Arbitration.................... 445
  Mining law revision............. 445
  Copper tax..................... 369
  Convention.................... 370
  By-laws....................... 370
  Mine manufacturing............. 371
  M. D. Foster................... 371
  Bureau of Mines................ 371
  Revenue bill................... 407
  Mid-year statements............. 408
  Smokeless firing of coal.......... 408
  Mr. Lane and Mr. Pinchot........ 409
  Coal problems.................. 409
  Cooperation and statistics........ 410
  Nineteenth convention........... 521
  Salary scale.................... 521
  Walter Douglas................. 521
  Balanced attendance............. 521
  Exhibitors..................... 522
  Carl Scholz.................... 522
  Compulsory arbitration........... 410
  Joplin........................ 411
  Vital issues to come up.......... 469
  Efficiency a necessity............ 469
  Only reputable firms allowed to advertise.................. 469
  Big things being done by cooperative effort.................. 469
Engineers name committee.......... 66

Experiment stations.......... 433
  probable location.......... 310
  selected.......... 355
Explosives, permissible.......... 360
  saving in..........129, 534

F

Fairbanks experiment station.......... 355
Fatalities, report on.......... 151
Fay, A. H., work praised.......... 530
Federal legislation..........72, 130
Ferberite, in Colorado.......... 126
Ferguson, H. G.......... 227
Field assignments.......... 452
Field meets.......... 400
  in California.......... 418
First Aid..........531, 536
  benefits of.......... 132
  training, example.......... 124
  progress.......... 320
  work standardized.......... 160
  Evansville incident.......... 354
  Juneau incident.......... 357
Flotation, literature on.......... 182
  process in Utah.......... 116
  importance of.......... 242
  in Joplin district.......... 189
Fluorspar, price.......... 306
Foster's program.......... 24
Foster, M. D. (cut).......... 509
Foster Bill, opinion on.......... 263
Forest regulations..........199, 221
Forests, management of.......... 332
Fossils..........451, 457
Friedman, L. A. (cut).......... 475
Fuel, saving of.......... 367
  for Government.......... 415

G

Gann, Thos. M.......... 534
Gas occurrence.......... 121
  measurement of.......... 151
Gasoline supply and price.......... 115
Gemmell, R. C., Utah Commission .. 191
Geographic names.......... 186
Georgia asbestos production.......... 307
Geologic time.......... 325
Geological survey, military training camps.......... 268
  preparedness in.......... 161
Gold production in South Dakota, 313, 314
Golden gets mines station.......... 68
Graphite, production of.......... 225
  in Texas.......... 360
  prices..........150, 319
    British order.......... 275
    stimulating.......... 260
    affected by war.......... 131
Great Lakes, geological history of.......... 397
Green sands, investigation of.......... 149
Ground water.......... 368
Gulfport exposition.......... 121

H

Harder's experiments.......... 63
Health precautions.......... 442
Hess, Frank L. (cut).......... 168
Hill, J. M., visits barium mines.......... 276
Holmes Memorial Association.......... 121
Holmes Safety Association..........61, 155
Homestake mine production.......... 310
  Paige hypothesis.......... 312
Hookworm in California.......... 304
Hoover, Theo. J., to open New York office.......... 498
Horner, Roy R.......... 540
House committee scored.......... 217
Houtzdale, coal mining.......... 231
Hurley, Edward N., meets operators..........310, 490

I

Incidental geological finds.......... 80
Industrial Relations Commission.......... 97
Insurance in Pennsylvania.......... 167
Interior building (cut).......... 121
Iron pyrite.......... 427
  bacteria.......... 354
  output.......... 319
  tonnage through canal.......... 494

J

James, H. G. (cut).......... 507
James, G. B.......... 527
Jones, Lewis M., dies..........495, 540
Joplin zinc ores.......... 62
Juneau operations.......... 101

K

Kaolin in the U. S.......... 120
Keith, Chas. S. (cut).......... 475
Kemmerer, M. S. (cut).......... 474
Kimball urges cooperation.......... 14
Kithil, Karl (cut)..........355, 526
Knopf, Adolph, sketch.......... 357
Korous, Miss Rose (cut).......... 379

L

Labor Department report.......... 21
Labor shortage..........420, 522, 527
Laist, Frederick (cut).......... 514
Lane praised.......... 258
Larsen, E. S., Jr. (cut).......... 445
Leasing legislation.......... 213
Leasing bill, opinion on..........267, 274, 477
Lead.......... 444
  production..........100, 315
Legislation..........250, 303, 385
  Federal.......... 528
  Thoughts on.......... 193
Library of Geological Survey.......... 437
Lignite.......... 404
  in North Dakota.......... 478
  in Texas.......... 508
  investigation.......... 212
  western.......... 234
Lupton, C. T. (cut).......... 399

Mc

McCaskey, H. D., sketch with cut.......... 314
  on relationship of metals.......... 434
McCord, Miss Julia L. V. (cut).......... 437
McDowell, J. C. (cut).......... 513

M

Magnesite mining.......... 236
Magnesium.......... 361
Maine has tin veins.......... 21
Mammoth Copper Company.......... 173

Manganese, buyers of.............. 416
Manganese output.................. 318
Manning, Van H................531, 535
  Harrisburg speech................ 169
  reviews work of year............. 4
  made member Research Council... 400
  addresses mine workers........... 59
  western trip..................... 433
  meets operators.................. 62
  urges law revision............... 90
Maps for five cents................ 160
Maryland coals..................... 478
Matanuska coal..................... 412
Metal mining methods............... 540
Metal mine fatalities.............. 173
Metallurgists...................... 126
Metallic arsenic................... 53
Metallurgy of Tungsten............. 20
Methane in Indiana mine............ 160
  indicator........................ 164
Mexican mining decrees............. 541
Mica.........................451, 455
Mid-continental field.............. 457
Mineral production in 1915......... 9
  Montana.......................... 11
  Oregon........................... 12
  Arizona.......................... 13
  Colorado......................... 15
  Idaho............................ 17
  Texas............................ 18
  Utah............................. 19
  Alaska........................... 22
  California....................... 25
  Washington....................... 28
  South Dakota..................... 39
  New Mexico....................... 42
  Nevada........................... 52
Mineral mine accidents......79, 135, 256
Mineral land decisions............. 187
Mine inspectors meeting........109, 286
Mines exhibit at Panama............ 74
Mining law......................... 526
Mining law revision................ 209
Moderwell, C. M. (cut)............. 474
Molybdenite duty................... 80
Molybenum, Horton's report on...... 157
  distribution.................114, 219
Montana, mineral production....325, 362
Morrow on guide books.............. 67
Mud laden fluid.................... 478

N

Nanadinite crystals................ 217
Nevada mountains................... 438
  camps, mapped.................... 156
New Mexico, mineral output......... 323
  chapter formed................... 342
Nickel.......................459, 537
Nickel, in U. S.................... 402
Nickel, Canadian production........ 226
Nitrate............................ 53

O

Oatman district survey............. 216
Ocean freight rates................ 231
Ohm, F. C., death of............... 192
Oil, in Colorado and Utah.......... 412
  prices........................... 406
  leasing manipulations............ 125
  men protest...................... 14
  in Teton County, Mont............ 354
  in Montana....................... 362
  shales, future of.........358, 410, 513
  cost compared.................... 313
Oklahoma, spelter output........... 401
Ore sampling, standardization of, 359, 402
Osage oil lands.................... 400

P

Paige, Sydney, sketch with cut..... 320
Pan American papers to be printed.. 480
Panama slides...................... 123
Paradox valley, storm in........... 126
Parsons, C. L. (cut)............... 276
  on coke making................... 215
Parker, E. W..................526, 536
Patents, policy as to.............. 530
Payne, Henry Mace........156, 518, 526
Permissible explosives............. 230
Petroleum, work of Bureau of Mines, 459
  production....................... 317
  mid-continental field............ 514
  altitude of wells................ 518
  Bureau of........................ 271
  logs on wells.................... 282
  experiment station............... 505
Phalen, W. C. (cut)...........279, 405
Division of work................... 400
Phosphoric acid.................... 395
Phosphorus fertilizer.............. 360
Phosphate output decreases......... 496
  demand foreseen.................. 519
Pitchblende, Colorado.............. 198
Platinum.................428, 436, 520
Platinum, Russian export tax....... 131
Platinum in Spain.................. 119
Pope, George S., sketch with cut... 330
Potash........................425, 518
  paper on, by W. C. Phalen........ 279
  at cement plants................. 294
  Searles Lake..................... 366
  work in.......................... 199
Prehistoric reptiles............... 94
President asks cooperation......... 66
Prospects, price of................ 152
Public interest in minerals........ 178
Publication committee, Bureau of Mines.............................. 136
Public land........................ 419
  policy........................... 505
Pyrites from Alaska................ 149

Q

Quicksilver output................. 318

R

Radium..............118, 443, 508, 550
  February delivery................ 149
  isolated twice................... 181
Riordan, D. M...................... 195
Randall resolution................. 240
Ransom, F. L. (cut)................ 192
Rare metals........................ 74
Registration at Mining Congress convention.......................... 545
Rescue cars........................ 405
Research council................... 435
  bill............................. 549

Restorations 459, 531
Revenue bill 349, 387
Revision of laws, committee report 5, 136, 283
  Foster wants action 494
  hearing 55
  Wickersham criticized 381
Rice, Geo. S. (cut) 268
  to Canada 540
  inspection trip 454
Riter, Geo. W., dies 392
Rittman, Dr. W. F 535
  process 132, 405
  acknowledges aid 232
  bulletin 257
Roberts, J. C. (cut) 198
Rochester district 343, 422
Rock dust application 179
Roslyn coal fields 165
Russian survey 397

S

Safety first, origin of 174
  exhibit 109, 196
  week 69
  train 269
  results 356
  tour ends 356, 400
Safety engineering 286
Safety work 449
Safety lamp 353
Saltpeter, price of 423
Salt Lake City, flotation center 65
Scheelite, production 308, 312
Scholz, Carl (cut) 473
  editorial 522
  presented watch 533
  complimented 534
  promoted 106
  testifies 223
Schrader, Frank C., sketch with cut 326
Seattle mining experiment station 529
Shaw, Eugene W. (cut) 428
Sieventhal, C. E 219
Silver production 313
  in Texas 309
Slate, in 1915 307
Sledge Tatum dies 63
Smelter rates 102
Smith, Philip S. (cut) 402
Smith, Sumner S 129
Smith, Geo. Otis (cut) 468
  to speak in Maine 471
  to address Geological Society 498
  oil testimony 148
  on public business 218
  on water power 64
Smoke is needless 362
Soapstone, output 131
South Dakota, gold production 314
Spelter output increases 95
  in Oklahoma 401
Spencer, A. C. (cut) 282
Spofford, Mrs. Edith (cut) 500
State geologists 309, 431
Steam shovels, in coal mining 396
Steel, small plants 367
Stream data 201
Strikes, address on 119
Strontium deposits 160
Sub-strata boring 114
Sulphur 397
  demand for 357
  in Louisiana and Texas 432
Supreme Court decisions 127
Survey appropriation 64
Sylvanite, data on 317

T

Talc, production 136
Tampico field 443
Tantalum, analysis of 323
  demand for 120
Taylor on Foster Bill 167
Technical terms 392
Tennessee mining boom 121
Texas silver production 309
Thompson, J. W. (cut) 512
Throat telephone 330
Tin, federal aid for 116
  in Alaska 76
Tin ore, sample of 256
Tintic District Bulletin 68
Tonopah, Baston report on 175
Topographic maps, in popular language 274
Tucson experiment station 355
Tungsten, prices 302, 398
  secondary enrichment 286
  foreign market for 393
  profit in 260
  as an alloy 214
  development 222
  low grade 362
Tupper, C. A. 550

U

Useful minerals 68
Utah, mineral output 321
  Copper Company 190
  News notes 113, 277, 331, 383
  Promontory district 417
  Special examination 311
Surveys 256
Unions and efficiency 439

V

Vaile, Joel F., dies 232
Vanadinites, use of 316
Vanadium in Colorado 23
  in Peru 400
Van Wagenen, F. W 196, 526
Vernadsky 400
Virginia mining boom 121

W

Washington, coal markets 489
Waste in mining 531
White, David 211
White, Dr. I. C 522, 526
Whitney, W. R. 493, 528, 537, 549
Wickersham book collection 61
Willard, H. E. (cut) 495
Williams, W. A 526
Withdrawals 531
Wolflin, H. M., sketch with cut 324
  succeeds Paul 244

Woodbridge, T. R., on sampling..... 441
Wood tin........................ 329
Working in thirty-six States......... 218
Wyoming, foundry coke............ 411

Z

Zang, Adolph, dies.................. 516
Zinc, sales of...................... 539
  importations.................... 496
  sold ahead...................... 276
  imports......................... 286
  production...................... 315
  in northern Arkansas............ 182
  rule for appraisement............ 455
  Hoad address................... 177

THE
MINING CONGRESS JOURNAL

JAN 1916

SAFETY—EFFICIENCY—CONSERVATION

VOL. II

No. 1

JANUARY, 1916.

Dr. Isaac Alzamora

Noted South American authority on mining, now in Washington

143407

PUBLISHED BY
THE AMERICAN MINING CONGRESS
PUBLICATION OFFICE
MUNSEY BUILDING WASHINGTON, D. C.
$ 2.00 PER YEAR
20¢ PER COPY

WILMOT ENGINEERING CO.

Works, White Haven, Penna.
HAZLETON, PENNA.

MANUFACTURERS OF

HIGH GRADE MACHINERY

FOR THE PREPARATION AND HANDLING OF

ANTHRACITE COAL

WILMOT RIVETLESS CHAINS for Conveyors for Elevators for Car Hauls

LLOYD COMPOUND (HOLLOW GROUND TOOTH) ROLLS

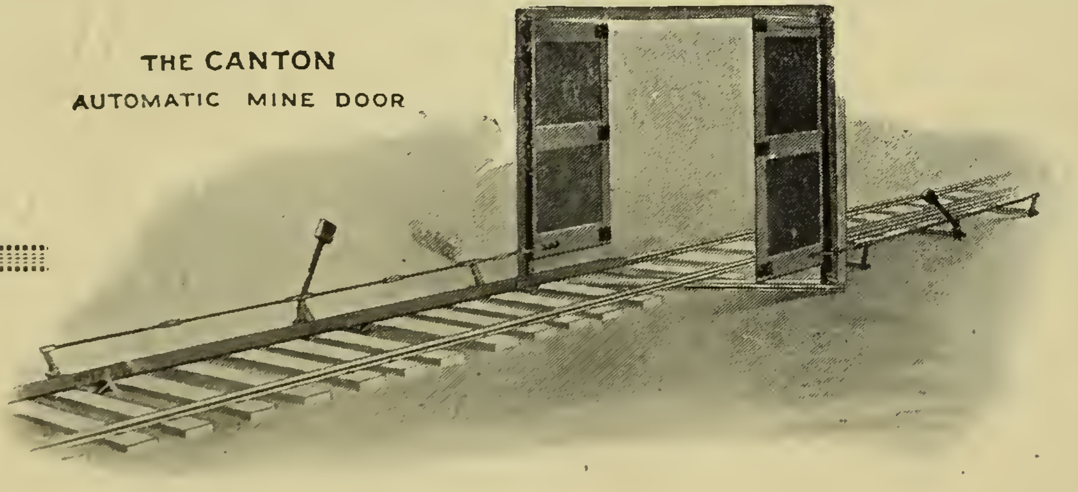
PARRISH Flexible Arm SHAKERS

SIMPLEX JIGS

handling
crushing
screening
cleaning

BEST SERVICE—LONGEST LIFE—LOWEST COST OF UP-KEEP

Let us figure with you on your new installation or replacing your old and obsolete ones



IMPROVED METHODS

Without Additional Expense

IF you contend for old time methods, you might try keeping time by employing a boy with a hammer and gong, to strike off the hours as indicated by a sun dial. ¶ A trial, however, will convince you that a good clock is cheaper and more reliable. ¶ So is the Canton Automatic Mine Door better than a trapper boy. ¶ Write for literature.

THE AMERICAN MINE DOOR COMPANY, Canton, Ohio

VOL. II, NO. 1 WASHINGTON JANUARY, 1916

THE MINING CONGRESS JOURNAL

Official Organ of the American Mining Congress

MINERS OF WESTERN HEMISPHERE EXCHANGE VIEWS AT PAN-AMERICAN CONFERENCE

Neglect on Part of United States to Develop Nitrogen Supply Leaves it Almost Helpless to Defend Itself Adequately, Noted Scientists Agree—Dr. Raymond's Work Commended

Ranking with the most important scientific gatherings ever held is the Pan-American Scientific Conference, which began its sessions in Washington December 27. Section 7 of the conference, dealing with mining, metallurgy, economic geology and applied chemistry, and Section 3, covering various features of conservation, are of direct interest to the mining industry. The conference was attended by a large number of the leading men in the mining industry, not only in the United States, but in each of the republics of Latin America.

The section was divided into sub-sections, of which Van H. Manning was chairman of that pertaining to mining; W. R. Ingalls, metallurgy; George Otis Smith, economic geology, and Charles E. Munroe, applied chemistry.

JENNINGS COMMENDED

To Hennen Jennings, chairman of Section 7, is attributed much of the credit for its successful conduct. Mr. Jennings was indefatigable in his efforts to make the meeting one of real profit to the industry, not only in the United States, but in all of the American republics. That he has succeeded is attested by the testimony of many of the most prominent men known to mining.

With reference to the conference, Mr. Jennings said:

"It has been a great event. The discussion of so many matters of vital interest to the industries, covered by Section 7, has imparted instruction that would have taken years to become available through ordinary channels.

"I consider that one of the most important events of the meeting was the privilege of hearing and communing with Dr. Raymond, the secretary emeritus of the American Institute of Mining Engineers. For forty-five years he has been the inspiration of the institute. In its early struggles he brought its transactions to such a high plane that it has tied together the mining men of the world in a society recognized to the corners of the earth.

"Dr. Raymond not only has aided the members of the society as far as the grave, but has done much in their memory, as he has written the biography of the members of the institute who have died."

On the opening day of the conference Section 7 met as a whole. On subsequent days each sub-section had its own meetings.

Mr. Jennings, in his opening address, said:

"I desire to be brief and give you speedy opportunity to hear those who have greater gift of expression than myself, and who, no doubt, you desire to hear as soon as possible. But, as chairman of this great section of mining, metallurgy, economic geology and applied chemistry, I must at least raise my voice to the full, though it be but feeble, to proclaim how great, how mighty, how all-comprehensive is my theme, and how, in fact, the whole fabric of modern civilization rests on its shoulders.

"Mining and agriculture are the only basic productive pursuits of man, and they are both fostered each by the other, and both dependent on Mother Earth. The one skims her surface; the other goes deeper. Agriculture furnishes man with food for existence, but mining gives him the materials for power, art and civilization. Without metals the scientists' tools for experimentation and discovnation would not be possible, nor the great diffusion of knowledge and thought by means of the printing press, photographic appliances, telegraph, cable, and the telephone.

A CONTRAST

"In contrast to the bewildering might of the battleship's guns, with their 1,400-pound weight and 2,600 feet per second velocity arguments, the metals have given man fingers so delicate, untiring, and accurate that they can work and control threads so fine that fleecy muslins and laces grow in abundance under their touch.

"Mining and metallurgy must go hand in hand, for each would be impossible or impotent without the other. Economic geology and applied chemistry are the necessary lights, guides, and inspirations to advance the power and usefulness of the miner and metallurgist.

"Agriculture and mining went hand in hand in modest moderation until a brief yesterday of fifty years, when, lo and behold! the scientist, inventor and engineer perceived that through the mineral kingdom they could generate and control forces as great and wonderful and obedient as the genii of Aladdin's lamp. With the steam engine, the turbine and dynamo, there was placed in man's hands the fundamental implements of manufacture and the flexible distribution of force. The main restraining bonds that confine and make effective the steam are iron and metal; those of the turbine and dynamo, iron, steel, copper and aluminum; while coal, petroleum, gas and water are the mighty driving forces. And gold must not be forgotten. It made all possible through its stored cells of human energy that radiated genial currents of trade confidence which inspired and gave courage to gigantic undertakings.

"In the manufacture of force the miner, scientist, engineer and mechanic all had to do team work and each aid the other, the miner giving to all others the necessary materials. In return, knowledge and skill were given mining projects that multiplied and expanded their outputs. And so the forces have traveled in cycles—the miner giving to the engineer, the engineer giving to the miner, and in such wonderful and startling way that the gold, coal, iron, copper and petroleum demanded in the manufacture of force and other needs of modern civilization have so progressively increased within the last half century that the past fifteen years' output of of these fundamental force producers and force restrainers have probably, with the exception of gold, more than equaled the total output of all previous time in the history of the world. With these outputs bank deposits, railroad construction, war armaments, steam vessels and other forms of wealth and power have sympathetically advanced.

A COMPARISON

Contemplate, then calculate, what is the force that has been unlocked by the mining of 535,000,000 tons of coal and 222,000,000 barrels of petroleum produced in 1912 in the United States. This force, if all used for steam and expressed even in the imperfect efficiency of the steam engine, would still show, in terms of man's muscular capacity, an equivalent of the work of 2,700,000,000 strong men working continuously for ten hours a day throughout the entire year.

"Falling water has also been harnessed and made use of by the copper band windings of the dynamo, and generates still other great forces. The chemist's great might, expressed through explosives, has also been given man within comparatively few years, and is being progressively increased. Thus, in so short a time, has the miner, metallurgist, scientist and engineer unlocked and tapped great force-fountains that the world has not had time to digest properly its uses or control the haste, greed and waste that has been brought in its train. And, although these forces have made possible the construction of the Panama Canal or the San Francisco Exposition, they are correspondingly responsible for the European war. But here I fear I am drifting away from my theme and getting on dangerous ground. It will be wise for me to call on the shepherd of our fold to extricate me from my difficulties.

INTRODUCES MR. LANE

"The Interior Department has the guardianship of the mining and metallurgical industries of this country. Its great Bureau of Geological Survey has been for long an aid and guide to the miner. Comparatively recently the Bureau of Mines has been established, which further aids both miner and metallurgist, and it is believed and hoped that under the present Secretary, who has ever shown rare interest and given intelligent support to the needs of the mining world, further progress will be made in output, safety and conservation. The mining world believes in him, and it is my privilege and pleasure to introduce to this meeting the Secretary of the Interior."

SECRETARY LANE SPEAKS

Secretary Lane spoke interestingly of the Government's intense desire to do all in its power to put mining on a basis that it will contribute in increasing volume to the greatness of the United States. He referred to the present European war, with the remark that, although life is a battle, it should be a battle between man and nature, not between man and man. One of the most important discoveries in this struggle is that man has found in nature herself the means of combating the evils that she sometimes uses as weapons against man. The most remarkable instance of this discovery is afforded by the work of Pasteur, which ranks amongst those that have been most beneficial to the welfare and progress of man.

MR. PEZET SPEAKS

In a happily worded address, the Peruvian Minister, Federico A. Pezet, outlined the mineral resources of Peru. Incidentally, his auditors were surprised at his fluent English.

He apologized for not being sufficiently technical, adding that mining and geology were two of the very few subjects with which a diplomat is not thoroughly familiar. He gave a brief description of the climatic and other conditions of his country and of its mineral and agricultural resources, all of which, he said, are very great and promising, but which, unfortunately, have not been developed, owing to lack of sufficient capital. He gave a long list of these resources, in which he included guano, gold, silver, mercury, manganese and many minerals which he could not name because their names were, to him, unpronouncable. He added that the country itself furnished fuel and water power in abundance for the exploitation of these resources. He ended by saying that he was speaking in earnest, neither boasting nor boosting, although he perhaps might be able to do a little boosting on occasion, having learned the art among his American friends in California.

TALKS ON PERU

Dr. Isaac Alzomora, chairman of the Peruvian delegation, gave a very substantial talk, dealing also with the resources of Peru and the many opportunities it offered to American capital and enterprise. He called attention to the liberality of the Peruvian mining laws, stating that for twenty-five years all the mining industries had been exempted from taxation; and yet, he added, it was strange that so few capitalists had availed themselves of such privilege.

DR. RAYMOND'S ADDRESS

One of the features of the whole conference was the address of Dr. R. W. Raymond, secretary emeritus of the American Institute of Mining Engineers, which was delivered December 28. Mr. Jennings introduced him as one of the best beloved and most universally known of all mining men. He suggested that, as Mr. Raymond is one of the men who is contributing so profitably to the industry, all men connected with mining are delighted to honor him.

Instead of following the line of the paper which he had prepared, he said he would follow the example of one of Shakespeare's heroes, who, holding a threateningly lengthy document in his hand, relieved his audience by saying, "I have it here, but, begging your pardon, I shall not read it." Dr. Raymond gave a brief verbal resume of his paper, in which he emphasized the value of technical societies as means of bringing together men engaged in the same pursuits, enabling them to interchange their knowledge and experience, giving professional ability an opportunity to become known and thereby receive recognition and disseminate information by means of appropriate publications. He ended with a hearty welcome to the Latin-American delegates, and expressed the hope that the much-desired union of the American republics in a great brotherhood of nations might be realized fully.

UNDERGROUND WATERS

W. L. Saunder, president American Institute of Mining Engineers, gave a verbal resumé of his paper, dealing with the application of compressed air to the air-lift for the raising of underground water. After this, the paper was submitted for discussion by the chairman, and several of the members asked questions which Mr. Saunder answered very fully, throwing a great deal of light on the subject and at the same time showing that he is a thorough master of it. He gave some curious details regarding the character of some underground currents. He told how several miles off the coast of Atlantic City fresh water can be obtained in large quantities by drilling through the bottom of the sea.

TELLS OF CHILE'S NITRATE

The most important subject discussed during the day was that of the nitrate industry. A very able paper on this subject was read by Enrique Cuevas, counsellor of the Chilean Embassy. He gave a brief history of the Chilean nitrate fields, and described at length their character and composition, as well as the methods of extracting and treating the material. He emphasized the fact that those deposits are practically inexhaustible, and that they probably will continue for several centuries to produce as much as they are doing today. The present output is valued at $75,000,000 annually. This, he remarked, refers only to that part that has been exploited; it is only about two-tenths of the whole available field.

He attributed the war between Peru and Chile, in which the former country lost two of its southern provinces, largely to archaic mining laws, which were the only statutes of that time. Many of his remarks as to the possibility of trouble growing out of inadequate mining laws were regarded as bearing a special lesson to the United States, where the industry is staggering along in misfit legal clothing.

Without question, the most spectacular discussion of the entire congress resulted from the comment by those present on this paper.

Dr. Thomas H. Norton, of the Department of Commerce, declared the nitrate matter to be the most important topic that could be brought before the attention of the Scientific Congress; for, he said, the nitrate industry is both a powerful element of construction and destruction. It is the main fertilizer through which nitrogen is made available for the production of valuable crops in soils that would otherwise be barren or of little value. In contrast, it is also the source from which the nitric acid used in the manufacture of explosives and other war materials is extracted. In connection with the latter feature, he said that war today was not, as commonly believed, controlled by bankers and other business men, but almost exclusively by chemists. He referred to the fact that the nitrogen needed for nitric acid can be obtained not only from the nitrates of Chile, but also from the atmosphere, where it exists as part of the air. Germany has developed very highly the methods for making this source available, the result being that today she is in this respect self-supporting, and therefore able to produce the vast quantities of explosives of which she is so much in need in the present unfortunate circumstances. The United States, he added, imports all its nitrate from Chile, whereas it not only could manufacture it by the same process that is used in Germany, but also could obtain it in large quantities from sea weeds aboundantly found in the Pacific, not far from the American coast. From this source alone about $90,000,000 worth of nitrate could be obtained every year, which is twice the amount paid for imported nitrate:

CONTROLLED BY CHEMISTS

Dr. A. S. Cushman, Director of the Institute of Industrial Research, spoke along lines very similar to those followed by Dr. Norton. Referring again to war conditions, he also declared that war is controlled by chemists rather than by capitalists, and made the statement that, according to information he had received from leading European scientists, the only thing that prevented war in Europe at the time of the Moroccan incident was the apparently simple fact that the chemists were not ready. Last year they were ready, and there was war. He deplored the sad fact that, although it was two Americans who first solved the problem of extracting nitrogen from the atmosphere for the production of nitric acid, very little has been done in the United States to turn their discovery to advantage. Capital refused to interest itself in their industry. They died of hunger, and today other countries owe their independence and self-support to that discovery, and can produce nitric acid almost indefinitely, whereas the United States has not enough of it to manufacture for more than a few weeks the war elements they would need in order to defend themselves against the aggression of a powerful nation. He concluded by saying that it was the duty of all those conversant with the situation to impress upon the people of the United States the necessity of making every possible effort, first, to keep in storage large quantities of Chilean nitrate, and, in addition, to put in operation on a large scale the methods of producing nitric acid from atmospheric nitrogen, which, he added, served not only the interest of industry in general, but the safety of the nation as well.

(Continued on page 36)

MANNING REVIEWS WORK OF YEAR BY BUREAU OF MINES

Millions of dollars, heretofore wasted, have been saved to the industries of the country by the United States Bureau of Mines, according to the annual report of Van H. Manning, director of that bureau. When the European war started and cut off supplies of raw products the bureau put its efforts to finding raw products in this country, and was successful.

The bureau called attention to the fact that $75,000,000 of coal-tar products were being wasted annually, while the industries were importing it from Germany. The bureau's work has resulted in the replacing of the beehive coke ovens, which wasted this product, with the new form of by-product ovens. Dr. W. F. Rittman's discovery of a process for the manufacture from petroleum of benzol and toluol, used in the manufacture of dyes and high explosives, is dealt with in the report. Dr. Rittman also devised a process which will enable refiners to increase the output of gasoline from crude petroleum 200 per cent or more.

The bureau has developed that the losses to the oil and natural gas industry in a year's time through careless and reckless exploitation amounts to $50,000,000, and has devised and demonstrated a practical process for drilling wells by which the waste of gas and the invasion of water may be stopped, thus saving in a single State natural gas worth more than $15,000,000.

Looking into the future, the bureau is investigating the vast deposits of the oil shales of Utah and Colorado, believing that the oil supply will come from them at no distant period. These shales, it is said, rival as sources of petroleum the oil shales of Scotland and New South Wales, which have been profitably exploited in spite of the continued competition of oil from other sources.

The studying of the combustion of coal by experts of the bureau has led to certain information that calls for new designs for furnaces which will prove more economical.

The experts of the bureau have been endeavoring to develop the use of what is known as the gas-producer, which burns a much lower grade of coal than the steam boiler and produces power, it is said, at less expense than other methods. They deplore the tendency in this country toward the almost exclusive use of high-grade coals and point to the ruthless waste and neglect of low-grade fuels, which is in sharp contrast to the situation in Europe. It is the expectation of these experts to see the railroads of the country operated by electricity, obtaining their power from gigantic gas-producer power plants located at the mines.

CHANCES FOR REVISION OF MINING LAWS ARE BELIEVED BETTER THAN EVER BEFORE

Great Stimulus Given Movement at Enthusiastic Meeting in Washington of Leading Mining Men—Mining Organizations Join in Effort to Free Industry of Archaic Statutes

Great stimulus was given the campaign for a revision of the mining laws of the United States by the meeting in Washington, December 16, of representative mining men from all parts of the country. The meeting was called by the Mining and Metallurgical Society of America in collaboration with the American Mining Congress, the American Institute of Mining Engineers, the Idaho Mining Association, the Montana Society of Engineers, the California Metal Producers' Association, the Spokane Mining Men's Club, the Nevada Mine Operators' Association, the Colorado Scientific Society, with representatives from several Chambers of Commerce and many operating mines.

W. R. Ingalls and F. F. Sharpless, president and secretary, respectively, of the Metallurgical Society, worked tirelessly to make the meeting a success. That it attracted important attention on the part of Congress is very evident. As a result hope is brighter for the initiation of steps looking to the revision of the mining laws.

MORNING SESSION

In opening the morning session, Mr. Ingalls explained briefly the object of the meeting. On motion Mr. Ingalls made the following appointments of committees:

Committee on Credentials—J. F. Callbreath, Secretary of the American Mining Congress; George Collins, Denver, and George C. Stone, New York.

Committee on Rules—J. P. Channing, New York; Seeley W. Mudd, Los Angeles, and Frank A. Ross, Spokane.

Committee on Resolutions—H. V. Winchell, Minneapolis; E. B. Kirby, St. Louis; Hennen Jennings, Washington; Walter Douglas, Bisbee, Arizona and John Kirchen, Tonopah, Nev.

Mr. Ingalls then called Carl Scholz, President of the American Mining Congress, to the chair. Mr. Scholz assured those present of the pleasure with which the American Mining Congress has cooperated in the meeting in an effort to hasten a revision of the mining laws. He called on E. B. Kirby, Chairman of the American Mining Congress Committee on Revision for a history of mining laws. The value of Mr. Kirby's paper was indicated throughout the session by the numerous times to which it was referred by the speakers. Extracts from Mr. Kirby's remarks are as follows:

Through all the confused records of mining customs and laws in the past, certain facts stand out clearly. First among these is the underlying conviction which seems to have been unanimous among all classes outside of the miners that those who worked or operated mines were created by a beneficient providence for the express purpose of being plundered. The main question always seems to have been: How much would the capital and labor engaged in mining stand without being killed off and who was to get most of the plunder?

A FIGHT FROM THE START

Hence mining customs and laws have been mainly the result not of steadily developing principles, but of incessant fighting. Mining codes therefore vary greatly, some having been beneficial and others disastrous to the industry. Mr. H. C. Hoover, in calling attention to some of these facts, points out that the contestants were usually four in number: the political head such as the king, prince or bishop, who desired mining wealth for his personal use; the State or community in general which wanted it for revenue, the land and the miner (which latter term of course, included both operators and workmen). All that saved the miner from extinction was the fact that without his skill no one could get anything. With relinquishment of the King's claims the contest has become triangular, while the State now bases its claims upon logic instead of power so that the main opponent of the operator at present is the land owner who still exacts his royalty of 12 to 30 per cent of the gross products.

Fighting over profits has naturally interfered with a proper consideration of what would be best for the welfare of the industry. The mining communities have always recognized more or less clearly what was necessary, but they have generally been under the power of others and have been forced again and again to submit to policies which have brought the industry to a standstill. Much of the bad legislation has been caused by the inability of well meaning, but non-mining men to understand the technical peculiarities of ore deposits and mining methods. It seems for instance to have been almost as hard to explain to Napoleon Bonaparte as to an average American lawyer, the reasons why ordinary land tenure is disastrous when applied to mineral land.

SOME GOOD RESULTS

Notwithstanding the confusion introduced by the desperate class struggles of the past, certain underlying facts have been made apparent.

(1) Mining is a very sensitive industry, easily destroyed, but wonderfully responsive to just and wise legislation.

(2) The laws best for the industry have been those evolved by the miners, whenever they have been free to work out their ideas.

(3) Ordinary land tenure kills the mining industry in most kinds of deposits and restricts it in all cases.

(4) It is not to the interest of the community to have ore deposits held undiscovered or unworked.

(5) The practical problem has always been the same; how to induce capital and labor to undertake the risks of mining; how to prevent the idle holding of deposits; how to prevent operators from tying up more ground than they need.

It is not necessary to touch here upon the long indictment against the American mining code for others are to address you upon that subject.

Now that it is at last to be revised it is of special interest to note how the greatest revision of history, that of 1783, was made. The procedure by which the work was accomplished was, for that government and that time, even more remarkable than the code itself. We are told that at the command of the King of Spain the miners throughout the Spanish dominions of America elected deputies who assembled in a cenvention and proceeded to frame the new ordinances. That the questions at issue were hard fought may be inferred from the fact that after many months the King found it necessary to force an agreement ordering the completion of the work within a certain time which made the total session about ten months.

The ordinances provided for a carefully planned system of administration required to make them effective and the King in adopting the code required the very men who had framed it to undertake the permanent administration of its operations. The new law was admirably adapted to the conditions of the time and has always commanded the respect and enthusiasm of mining men.

SECRETARY LANE SPEAKS

Mr. Scholz then introduced Secretary Lane, who spoke in part as follows:

"I ought to have some sympathy with mining men, mining engineers, prospectors, operators, because I lived all the early part of my life among them. I grew up in an atmosphere of speculation in mines and the development of new processes. The soil of California in its early day was not regarded as nearly as precious as it is today. Within my own life, I remember well the time when it was not dreamed that California could ever ship 40,000, 50,000 or 60,000 carloads of oranges a year, but now we pride ourselves upon being the great gold exporting center of the world. And as a boy I knew practically all of those men who did so much for the early development of our western country. I lived for a time in the house of a man whom perhaps most of you knew only by name, but he was in his day a very considerable man in our part of the country and an aid in our development—Mr. Ross Brown.

"All the men of the famous Comstock mine were familiar sights to me on my way to and from school, and I lived near the palaces which they built upon Knob Hill. I wondered if there was a possibility for me to have one of those palaces some day.

HONORS WILLIAMS

"As I look over the audience, my eye lights upon one man whom I am proud to honor. This last year a great distinction came to me, an event of which I am more proud than anything else. I received the degree of LL.D. from my home university, the University of California, which did so much for the development of our mineral resources, and there is in this audience the man who is the oldest survivor of the class of 1865. He then received that degree. He represents the earliest date and I am the latest date—Mr. Gardner F. Williams.

"I know why it is that you gentlemen are so drawn to this profession. It is not the mere making of the money, though that, of course, is not overlooked, but it represents that spirit of adventure which is the very strenuous spirit of America. I doubt if all the lure of the wealth that is to be made in Chile, California, China, or South Africa would have drawn out of you the enterprise and the imagination that you have shown. You are drawn on to this work because of your desire to discover something that man before has not known. The prospector is not the only adventurer in mining. The man who sinks the deep shaft, the man who drives the long tunnel, the man who makes the new machine, the man who develops the hydro-electric power to develop the mine, the man in the laboratory who works out the new processes; all of them are equal adventurers seeking the novel sensation of revealing something to the world, and I hope that the Department which I represent can help you in your quest.

"I want to see the Bureau of Mines erected into a great power not only to emphasize to the people of the United States the magnitude of the wealth and the resources that we have in our mines, but the possibility of making the United States strong and independent and self-sufficient.

WANTS ONLY TO AID

"We want in no way to hamper the development of this industry. We want to do everything to further it. Congress has allowed the establishment of experimental stations. It so far has allowed no money for that purpose. Their processes are somewhat slow but not at all hopeless. When we have these experimental stations we want to have them under the command of men of science who will be able to help you. I hope that in course of time we will develop for the mines of the West and the mines of the East an interest just as strong as the Government has shown for the farmers.

"One of the things that has concerned me somewhat has been the confusion in mining law. I belong to the legal profession. You are expert engineers. A more dangerous combination cannot be produced. If there is any combination on earth that can develop confusion and make it worse confounded, it is such a combination as that, and as an outgrowth of our enterprise we

1. The mining laws of the United States should be revised, not piecemeal but thoroughly, so as to coordinate and harmonize its various provisions.

2. For the purpose of giving the fullest consideration to the needs of every branch of the mining industry and every section of the country as affected by the mineral land laws of the United States, it is desirable that a government commission be created by act of Congress, whose duty it shall be to investigate by every proper means the questions and interests here referred to, and to make recommendations as to a basis for the proposed mining law revision.

3. That in order to represent the classes of men whose interests will be affected, the proposed commission should consist of five members; one representing the legal profession, one representing the Department of the Interior, and three men actively interested and experienced in mining and the acquisition and handling of mineral lands.

4. That this commission shall be selected and appointed by the President of the United States..

5. That this conference believes that the services of such a commission are deserving of compensation, as well as reimbursement for all necessary expenses, but is more concerned with the actual establishment of the commission and its character than with the question of emolument; and will gladly see the work done through an honorary commission if Congress deems it advisable.

6. That this conference expresses itself in favor of the creation of a permanent committee on mining law revision, such committee to consist of five members from the Mining and Metallurgical Society of America, five from the American Institute of Mining Engineers, and five from the American Mining Congress, and be appointed by these organizations. Such committee to have the power to select its own chairman and secretary and to add to its membership not to exceed ten additional mining men or others interested in the subject for which the committee is created. The work of this committee shall be to further the interests of the mining industry through Congressional action in accordance with the resolutions adopted at this conference; and its joint report shall be presented to each of the societies formally represented in its make-up.

have drawn into the law of this country intricacies which might at least have been avoided, and the problem for us is to get that line made straight, and therefore, in advance of the publication of my report, I confide to you the fact that I have given my endorsement and made an appeal to Congress for the establishment of a Commission that would revise the mining laws.

SEES BRIGHT FUTURE

"Ten years from now, or twenty years from now, you gentlemen I trust, will return to Washington and you will find then a far greater interest taken in your profession because the world will then have realized how absolutely dependent upon the mineral production is the development of an industrial people. The theory was, 120 years ago, that we could live well as a body of agriculturists and that this country could be happy and maintain itself as a democracy only if we were farmers. Some way or another by the adventure of your predecessors we have discounted that idea and the more we advance as an industrial people the more we realize that the very foundation of our hope lies not only in those things that are above ground, but in those things which are under the ground. To reveal their mysteries and develop them is the purpose of the Department at the head of which I am, but we need the support of the mining men of the country and the sympathy of Congress."

CALL ON TAYLOR

At the request of those assembled, Representative Edward T. Taylor of Colorado was called to the platform to explain in detail the bill which he has introduced in the House of Representatives looking to a revision of the mining laws. Mr. Taylor read his bill. He told of his efforts during the seven years that he has been a member of the Committee on Mines and Mining to pass a measure on the lines of the one he has presented this year. Mr. Taylor went to Leadville, Colorado thirty-five years ago and feels that through his intimate knowledge with mining conditions in the West he is thoroughly able to judge of the methods best suited to mining conditions which have a chance of passing.

Incidentally, Mr. Taylor told of his efforts to secure the passage of the bill which provides for ten mining experimental stations. Mr. Taylor stated that one of these stations probably will be located in Alaska and the other two in the United States. He believes there will be no question as to passage of a bill providing the appropriation for the opening of these stations.

Mr. Taylor told of the difficulties which has surrounded his work in the House. Even on the Committee on Mines and Mining, which consists of fourteen members, he is the only member from a metal mining district. In spite of the various handicaps which existed at the last session of Congress, Mr. Taylor was able to get a favorable report on his bill.

EXPLAINS BILL

Mr. Taylor compared his bill, with that of Senator Smoot which passed the Senate at the last session. He pointed out that the principal diference between the bills is that Senator Smoot's asks for a salaried commission, where as Mr. Taylor believes his bill will have better standing in the House of Representatives if the commission is an honorary one.

Mr. Taylor stated that he believes high class commissioners can be secured who will serve without salary. He believes the commission should be paid for its services, but that the objection in the House of Representatives to commissions, of which there have been so many during recent years, is such as to militate in the passage of any bill which provides for a commission. He also dislikes the clause in his bill which provides for the exemption of lands containing coal, phosphate and other substances. This clause however was made necessary by the attitude of the administration and of the Secretary of the Interior who will oppose any bill which would interfere with their leasing plan. Mr. Taylor read an extensive extract from the Committee Report on his bill. He spoke highly of D. W. Brunton of Denver, from whose remarks before the Committee he read extensively.

PRESSURE NECESSARY

There are 40,000 bills introduced at each session of Congress, Mr. Taylor pointed out, and of this number only two per cent go through. He called attention to the fact that in order to pass the bill there must be great pressure behind it. It particularly is the case with the bill providing for the revision of mining laws, as it is metalliferous mining which is principally interested. Coal mining, he said, is not concerned to the point of taking any energetic action to secure the passage of the bill. Since there are only thirty-six Congressmen from metal mining districts it is absolutely necessary that pressure be brought by the public, Mr. Taylor said.

Following Mr. Taylor's remarks, Mr. Scholz urged that each member consider it his duty to use all influence that he can bring to bear on Congressmen from their districts to take an active interest in the matter of securing revision of the mining laws.

Secretary Sharpless then read the bill of Senator Smoot. Instead of a commission of five, as provided by the House bill, Senator Smoot's commission is to consist of three members, one of which is to be a practical miner and the other two to be attorneys with large experience in handling mining laws.

When the matter was thrown open to discussion, Mr. Macbeath, of Idaho, stated that he represents 1,100 mining men in his state, who object strenuously to having two attorneys on the commission. He suggested that there be one engineer, one practical mining man and one lawyer, on the commission. Mr. Macbeath, along with others made decided objection to the feature of Mr. Taylor's bill which recognizes the Government's leasing plan.

CANNOT OPPOSE LEASING

At this point Mr. Taylor called attention to the fact that ninety-five per cent of all bills passed by the House of Representatives are with unanimous consent. He said there would be absolutely no chance of passing his bill, if it conflicted with the federal leasing policy being backed by the administration. Mr. Taylor stated that he believes it would be best to secure all the other benefits which his bill provides, rather than postpone indefinitely these advantages, because of the general dislike on the part of western men to the leasing plan. It will be a comparatively simple matter, Mr. Taylor explained, to amend the bill in case the leasing bill should fail at this session.

Some objection was voiced to the appointment of the commission by the President. Mr. Taylor believes that it would be best to have the President undertake this work in order to get away from the delay which would be occasioned by arguing the details of the personnel of the commission on the floor of the House.

HAVE DATA ENOUGH

Judge J. W. Thompson, of the Bureau of Mines, asked what information can be gained by a commission as is proposed by the bills of Senator Smoot and Representative Taylor. He intimated that sufficient data is at hand to formulate intelligent mining laws without the delay and expense which would come through an extended investigation made by a special commission.

Horace V. Winchell, of Minneapolis, gave it as his opinion that it is very necessary that a commission make a careful study of the matter of the revision of mining laws before any action is taken. Mr. Winchell has been in charge of the investigation made by the Mining and Metallurgical Society with the view of learning just what the mining interests of the country want in the way of revision. Thousands of letters were received by Mr. Winchell and the difference of opinion is very marked. He believes that a great deal of careful and systematic work will be necessary before an effective mining code can be arranged.

It would be necessary for the commission to take testimony in most of the principal mining camps, and to make a detailed study of mining laws and their effect in other countries.

Mr. Keller, of Lead, S. D., strongly endorsed the view expressed by Mr. Winchell, and also stated that South Dakota mining men almost unanimously favored a commission which will serve without pay. He says there are many big men in the mining industry who put patriotism above dollars.

Mr. Ross, of Washington, declared that the miners of the Northwest had lost heart and faith in securing action toward getting better mining laws. The inefficiency of American laws is accentuated, in Washington, due to the close contact with mining conditions in British Columbia. Due to the general belief that efforts of mining men are accomplishing nothing in the campaign for better laws, there was much opposition to sending a delegate to this meeting. At first it was decided absolutely not to participate, but finally in the hope that some little good might result, Mr. Ross was sent to Washington.

Mr. Winchell declared that Congress must not only be asked to make this necessary change in the laws and relieve the mining industry of a

(Continued on page 40)

PRODUCTION OF AMERICAN MINES REACHES HIGHEST POINT IN 1915

Output for Year Just Ended Will Reach $2,500,000,000—Copper, Iron and Zinc Show the Largest Increases—More Than $120,000,000 Worth of Zinc—Gold and Silver Yield Larger

During the year just closed the mining industry in the United States made the best showing in its history. In all probability the mineral producton of the country for the last twelve months will amount to $2,500,000. Remarkable increases in production have taken place in practically every mining State of the Union. The increase in Montana over 1914 is 81 per cent, and in New Mexico is 60 per cent. The showing made in other States is little less striking.

One of the notable features of the announcement is that practically exact figures of production were furnished within a few days after the close of the year. This is made possible by the wonderfully efficient organization of the United States Geological Survey. Dr. George Otis Smith, the director, believes that one of the important necessities in the collection of data is that the results be made public as early as is possible. As a result of this policy the country will be informed during the first week of the new year as to the output of its mines during the year just closed.

The midyear review of mining conditions reported to the Secretary of the Interior on July 1 by the Director of the United States Geological Survey is well supported by the preliminary reports for the year submitted today. The Geological Survey is making public is usual estimate of mineral production for 1915 in the form of a separate statement for each of the more important mineral products.

A review of these statements confirms Secretary Lane's comment of last July to the effect that the mining revival is in full swing. In the Western States alone the metal production shows an increase in value of more than $130,000,000 over the corresponding figures for 1914; and the year's increase in output for the principal metals, measured in value, is more than $250,000,000.

In the response to bettered conditions the production figures for copper, iron and zinc show the largest increase.

COPPER BEATS ALL RECORDS

The copper mines passed all records for previous years, the 1915 output having a value of $236,000,000, or $83,000,000 more than the value of the production for 1914. The statistics and estimates received place the output of blister and lake copper at 1,365,500,000 pounds, or more than 120,000,000 pounds in excess of the largest previous production, and 18 per cent above last year's figures. Only twice in the history of copper mining has there been a larger increase in quantity of metal produced.

LARGE INCREASE IN IRON

The total shipments of iron ore from the mines in the United States in 1915 are estimated to have exceeded 55,000,000 gross tons, an increase over 1914 of more than 38 per cent. Based on the same price as received in 1914, this represents an increase in total value of about $27,645,000. The increase in pig iron is estimated at 6,500,000 tons, with a total increase in value of pig iron production of more than $120,000,000.

ZINC RECORDS ALSO BROKEN

The output of zinc (spelter) made from domestic ores was larger than ever before, being about 425,000 tons, worth $120,000,000, as compared with 343,418 tons in 1914, an increase of about 82,000 tons, or nearly 25 per cent in quantity, and of $85,000,000 in value. Production was increased during the latter half of the year, as the production during the first half, was at the rate of 415,000 tons annually and at the rate of 436,000 tons during the last half.

The output of refined pig lead from domestic ores was about 515,000 tons, worth about $48,500,000, as compared with 512,794 tons in 1914, an increase of only 2,500 tons in quantity, but of $8,500,000, or 20 per cent in value. The production of antimonial lead was 20,550 tons, as compared with 16,668 tons in 1914, an increase of 3,882 tons, or 23 per cent in quantity, and an increase in value of nearly $2,000,000.

GOLD AND SILVER INCREASES

The annual preliminary estimates on the production of gold and silver in the United States, made jointly by the United States Geological Survey, and the Bureau of the Mint, are not yet complete, but early figures based on reports from the mines indicate an increase in mine production over that of 1914 of over $7,000,000 in gold, principally from Colorado, California, Alaska, Montana, and Idaho, and an increase in mine production of silver of fully 4,000,000 ounces, chiefly from Montana, Utah, and Arizona. This increase in gold production may bring 1915 up to the record year of 1909, when the gold output of this country was nearly $100,000,000.

Quicksilver also has had its best year in

1915. The quantity increased 25 per cent over 1914, but the value of the output more than doubled, owing to the much higher prices. The estimated production was 20,681 flasks of 75 pounds each, valued, at the average price for year—the highest in the last forty years—at $1,768,225. In value, this domestic production was the highest since 1881 and in quantity the largest since 1912.

SMALL CHANGES IN COAL

The production of bituminous coal and anthracite in 1915 is estimated to have increased between four and five million short tons, or less than 1 per cent. The quantity of bituminous coal mined increased about six and one-half million tons, and that of anthracite decreased over two million short tons. Owing mainly to steady demands for export coal and for coke for steel making, the output in Pennsylvania, West Virginia, Kentucky, and Alabama increased over last year, but little change is recorded in other Eastern States. The region west of Ohio, including the Mississippi Valley, shows a general decrease, Colorado being the only Western State to show betterment.

Connected with the coke industry was the completion during the last summer of a number of large plants for the recovery of benzol from by-product coke-oven gas. This gives the United States its first output of this material, so important as a raw material in the manufacture of high explosives and chemical dyes, and the amount of this product will be reported later.

Preliminary estimates of the total output of petroleum in the United States in 1915 indicate a slight increase over the corresponding output in 1914. It is believed that the total petroleum yield of the United States in 1915 amounted to 291,400,000 barrels, of which quantity it is also estimated that 267,400,000 barrels was marketed, and 24,000,000 barrels placed in producers' field tankage during the year.

The sulphuric acid industry in 1915 presented interesting development. In spite of the abnormal demand and higher prices in the latter half of the year, much of the sulphuric acid had been contracted for or was consumed in the factories where made. The estimated production indicates an increase of 6½ per cent in the three common grades, but more than 100 per cent in the strongest grades.

The estimate of Portland cement output in 1915 indicates shipments from the mills of 86,524,500 barrels, an increase of one-tenth of one per cent over 1914. There was a slight decrease in production and this, with the appreciable decrease in stock, indicates a more conservative trend in the industry, which in the preceding few years showed a tendency to overproduction. Prices generally averaged a few cents lower per barrel in 1915 than in 1914, although toward the end of the year prices were substantially increased, and the outlook for 1916 is brighter than for several seasons.

IN WESTERN STATES

Perhaps the most notable item in the year's record is the stimulation of metal mining in the Western States. Almost without exception the increases in production were large and in several States 1915 was the best year on record. In Arizona, which leads in copper, the output of that metal exceeded the previous record production of 1913. California continues to lead in gold and had the largest yield in thirty-two years, and with one exception in half a century. In Montana and Arizona record outputs of silver are reported, and in Alaska the increased production of gold, and especially copper, made 1915 a much more prosperous year than even 1906, when Fairbanks and Nome were yielding their greatest returns of gold from bonanza placers.

NATIONAL ZINC COMPANY LOSES DUTY PROTEST

The National Zinc Company has been overruled in an important protest before the board of general appraisers in the matter of additional duty on zinc bearing ore from Canada and Mexico. General Appraiser Hay wrote the opinion of the board. Boiled down it is as follows:

1. Manifest Clerical Error.—There can be no manifest clerical error within the meaning of that phrase as used in paragraph I of section 3, tariff act of 1913, where the record discloses that the value stated upon entry though too low was deliberately so stated.—Meyer Bros. Drug Co., G. A. 5667 (T. D. 25257), United States *v.* Wyman & Co. (4 Ct. Cust. Appls., 264; T. D. 33485).

2. Contemporaneous Administrative Construction.—A practice in the collector's office in the liquidation of an entry of merchandise bearing a specific rate of duty will not be held to be a contemporaneous construction of the law when that duty is changed from a specific to an ad valorem rate, even though the practice is not changed for some time after the change in the law.

3. Change from Specific to Ad Valorem Rate.—The change by Congress from specific to ad valorem duty on merchandise carries with it all of the provisions of existing law that apply to the administration of the customs in the assessment of ad valorem duty upon imported merchandise.

4. Zinc-Bearing Ore—Additional Duty.—Under paragraph 162 of the tariff act of 1913, the zinc contained in zinc-bearing ore is made dutiable at 10 per cent ad valorem. If the unit value is not stated in the entry, but the total value when reduced to units is less than the unit appraised value, the additional duty provision of paragraph I is properly applied by the collector in assessing duty.

"I hope that in course of time we will develope for the mines of the West and the mines of the East an interest just as strong as the government has shown for the farmers."—Franklin K. Lane, Secretary of the Interior.

MONTANA PRODUCES MORE METALLIFEROUS ORES THAN EVER BEFORE IN HER HISTORY

Increase Over Last Year's Production is Eighty-one Per Cent—Output of Copper Runs as High as 22,000,000 Pounds a Month—Spelter Shows Increase of Sixty-one Per Cent

The value of the output of gold, silver, copper, lead, and zinc from Montana mines in 1915 was nearly $87,000,000, an increase of more than 81 per cent over the total value of the same metals in 1914, which was $47,849,747, and is the greatest annual value of metals produced in Montana. There were increases in the output of all metals, but especially of lead and zinc. Though quantities show increases, the large increase in value was even more the result of a great rise in prices. The figures are derived from preliminary estimates by Victor C. Heikes, of the United States Geological Survey.

The mine output of gold was valued at nearly $5,000,000 against $4,117,911 in 1914, an increase of over 21 per cent. There was a larger gold output from placers, particularly from dredging in Alder Gulch, in Madison County. The production of gold from siliceous ores also increased, especially from the Barnes King property in Fergus County, and, stimulated by better prices for the base metals during the later part of the year the gold yield from copper ores, lead ores, and zinc ores was greatly increased. The Kendall mine was productive through lessees, and in the later part of the year was purchased by the Barnes King Co. In July the Lane mills, at the Piegan-Gloster mines, began operations. In Lewis and Clark County, at the Porphyry Dyke property, a 20-stamp mill was operated on low-grade ore until it was closed on account of a water law suit.

SILVER SHOWS GAIN

The mine output of silver in Montana increased from 12,016,460 ounces in 1914 to about 14,500,000 ounces in 1915. This output shows an increase of nearly 21 per cent and is even greater than that of 1913, which was the record up to that time. The increase was due not only to the enlarged output of copper ore, which supplies the greater part of the silver, but to the great impetus given to the marketing of zinc ores. As the average price of silver was less than 50 cents an ounce in 1915, the value of the output was only increased about $595,000.

Montana's greatest asset is copper, the output of which increased from 233,229,640 pounds in 1914 to nearly 275,000,000 pounds in 1915. This was an increase of nearly 18 per cent over 1914, but the output did not reach that of 1913. In the early part of the year the mines were adjusting themselves to conditions imposed by the European war, but as the price increased from 13.60 cents in January to 19.75 cents in July, every effort was made to market the metal. According to the published monthly output of the Anaconda works, the copper production increased from nearly 14,000,000 pounds in January to over 22,000,000 pounds per month in the middle of the year. Production at the East Butte smelter was resumed in May, and the plant was said to be making 2,000,000 pounds of copper in July. In October the smelter was overhauled and a flotation plant was installed. The Butte and Duluth, from which copper was produced by leaching in 1914, was idle in 1915 on account of financial difficulties. The leaching plant at the Bullwhacker mine was not operated, but in the latter half of the year considerable copper ore was being shipped to the smelter from this property. The North Butte Co. produced nearly 8,000,000 pounds of copper during the first half of the year, and considerably increased the rate of production toward the end of the year, as did several other copper mines in the same district.

GREAT GAIN IN LEAD

The mine output of lead increased considerably—from 9,656,008 pounds in 1914 to slightly over 14,000,000 pounds in 1915. This increase of over 45 per cent was due largely to the shipment of lead concentrates and of residues resulting from zinc smelting. Both the Butte and Superior and Elm Orlu zinc mines produced a lead concentrate. The Franklin mine and the Valley Forge mine, in Lewis and Clark County, and the Iron Mountain mine at Superior, contributed to the lead output. The latter property was acquired in July by the Federal Mining & Smelting Co., of Wallace. The value of the lead output increased from $376,584 in 1914 to about $651,000 in 1915.

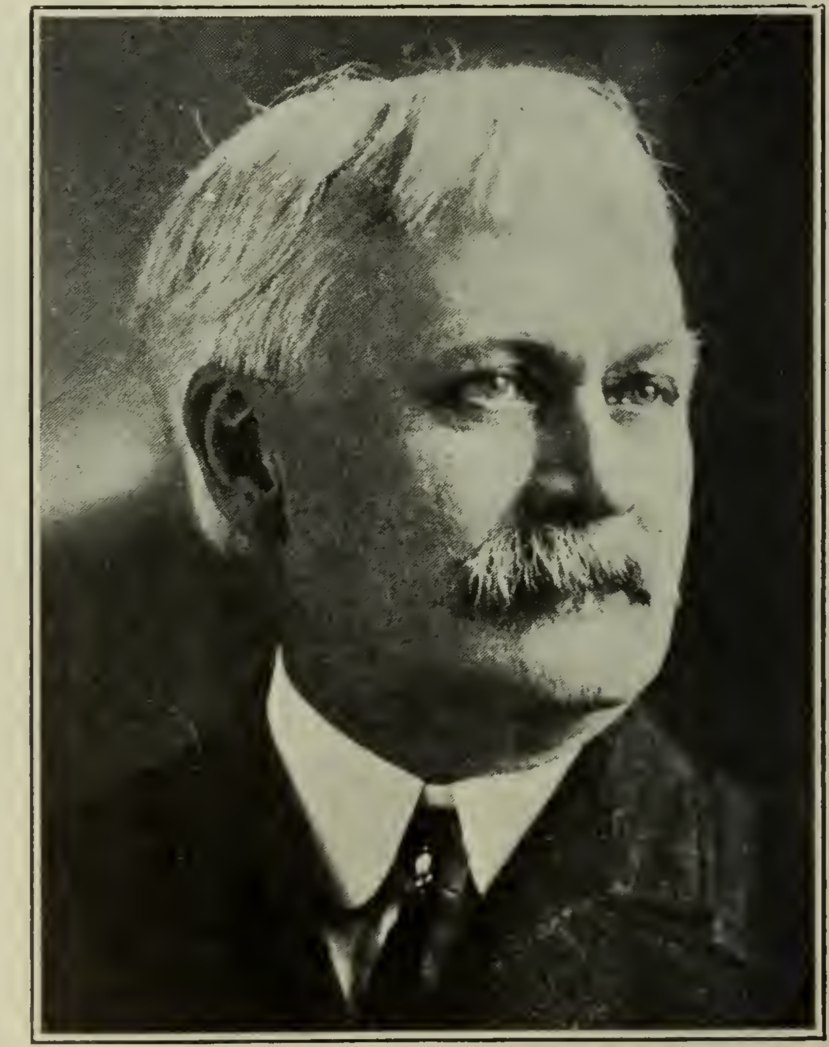
The mine production of zinc increased from 111,580,544 pounds (figured as spelter) in 1914 to 184,086,000 pounds in 1915. The spelter output represented an increase of nearly 61 per cent in quantity, but as the price of the metal increased from 6.20 cents in January to 22.2 cents in June there was an increase in the value of the output from $5,690,808 in 1914 to over $26,000,000 in 1915. The two main producers were the Butte and Superior and Elm Orlu mines, at Butte. Lesser outputs came from tailings concentrated at Basin; from the Iron Mountain mine, in Mineral County (formerly Missoula County); the Silver Cable mine, near Taft; and a property near Victor, in Ravalli County. The Anaconda Copper Co., in the latter part of the year, entered the zinc field by constructing an electrolytic plant, and some of the product was marketed before the close of the year. Some mines of this company at Butte are being developed for zinc ore.

The largest dividend payers were the Anaconda, Butte and Superior, and North Butte.

OREGON IS IN NEED OF CAPITAL FOR DEVELOPMENT

Preliminary estimates of the output of metals from Oregon mines in 1915, by the United States Geological Survey, show material increases over the figures of 1914 in both gold and copper, and slight decreases in yield of silver and lead. The gold yield for 1914 was $1,591,461 and the estimate for 1915 is $1,771,618 which is an increase of $180,157 for 1915. The silver output for 1914 was 142.552 ounces, and the estimate for 1915 is 136,033 ounces, or 6,519 ounces less. The yield of copper in 1914 was 39,248 pounds, while the estimate for 1915 is 910,104 pounds, an increase for 1915 of 870,856 pounds; and the yield of led was 16,436 pounds in 1914, as compared with 6,650 pounds in 1915, or 9,786 pounds less. These preliminary figures are compiled by Charles G. Yale, of the San Francisco office of the Survey.

It is noteworthy that such material increases in output of gold and copper should be apparent when the fact is considered that the number of producing mines in Oregon has fallen off fully one-third in the past two years. Those which have dropped from the producing list, however, have been mainly small placers of various kinds where the ground has been worked out, or has failed to pay. The larger deep mines continue their productive career, with few exceptions, but not many new properties of moment have of late been opened. More capital for mine development is needed in the State, where there are few extensive properties in operation. Baker county continues to be by far the most productive county of the State, yielding annually full 85 per cent of all the gold. The most productive deep mine in Oregon in 1915, as also for the preceding two years, was that of the Commercial Mining Company, operating the Rainbow mine in Cracker Creek district, Baker County. This property is shortly to be turned back to its original owners. Among other large producers in the same county is the Cornucopia Mining Company, in Cornucopia district, which in 1915 increased its output for the reason that they encountered higher grade ore on the lower levels than they had before. The Baker Mines Company, in the same district, has put in a 500-ton mill, and has been operating most of the year. In Cracker Creek district, also in Baker County, the Columbia Mines Company made about the same yield as in the previous year. The output of the Humboldt property, in Mormon Basin district, Malheur County, was not as high as in 1914. The Ben Harrison mine, in Granite district, Grant County, was closed down most of the year 1915 and will not begin operations until next spring. Of the placer mines in Oregon, most important enterprise is that of the Powder River Dredge Company, Cracker Creek district, Baker County. This company, which owned but one dredge in 1914, put another one in operation in the same field in 1915, and it is to the work of this company that the increase in gold yield in the State for the year is mainly due. Other placer mines are the Osgood, Waldo district, Josephine County; the Layton, in Applegate district, Jackson County; and the smaller mines around Grants Pass, in Josephine County. The gold yield from the dredging operations is greatly in excess of that from all other forms of placer mining combined.



CHARLES E. MUNROE

Noted chemist who took prominent part in the Pan American Scientific Conference.

> "I want to see the Bureau of Mines erected into a great power not only to emphasize to the people of the United States the magnitude of the wealth and resources that we have in our mines, but the possibility of making the United States strong and independent and self-sufficient."—Franklin K. Lane, Secretary of the Interior.

ARIZONA MINES PRODUCE NEARLY 50 PER CENT MORE THAN IN 1914

Nearly $26,000,000 More Copper Sold during Year Just Closed than During Previous Twelve Months—Zinc Sales Show an Increase of More Than $2,000,000—Gold Output Remains About the Same

The output of gold, silver, copper, lead, and zinc at mines in Arizona in 1913 was valued at $88,551,000, according to the United States Geological Survey, an increase of nearly 48 per cent from that of 1914, which was $59,956,029. There was very little change in the output of gold, but there were notable increases in the other metals, especially in lead and zinc. Increased prices made a difference of nearly $26,000,000 in copper, $400,000 in lead, and over $2,000,000 in zinc. These figures are the estimates of V. C. Heikes, Statistician, of the Survey.

The output of gold in Arizona mines increased about 1 per cent from that of 1914, which was $4,179,155. Gold production from copper ores increased, as every effort was made to market copper bullion when the price advanced, but gold from siliceous ores decreased, three of the largest producers of the State having a combined decrease of about 30 per cent in gold and silver bullion. The Commonwealth mine, at Pearce, was also a large producer, though the main value of the bullion was in silver. The discovery of gold near the Tom Reed mine at Oatman was of interest in 1915. There was considerable activity in the camp, where a large body of gold ore is said to be opened at the United Eastern property, east of the Tom Reed mine. In August about 20 tons were being shipped daily to the Gold Road Mill, and later in the year preparations were made for building a 200-ton mill.

SILVER PRODUCTION INCREASES

A record production of silver was made from Arizona mines in 1915, the output increasing from 4,377,994 ounces in 1914 to about 5,458,000 ounces in 1915, or over 24 per cent. The value of this output increased to about $2,718,000. The greater part of the silver, as formerly, came from the copper ores, but the increase in the shipments of silver-lead ores also contributed to the increase. The silver production from zinc ores and lead-zinc ores is not great, but siliceous ores in Cochise County supply a material percentage. The Commonwealth mine, at Pearce, was treating approximately 10,000 tons of ore a month, making bullion containing principally silver. At the Tombstone property, operated by the Bunker Hill Mines Co., ore and tailings were being treated by cyanidation toward the end of the year. Work was resumed at the McCracken silver mine in the Owens District of Mohave County, for which a mill is planned.

Arizona is the leading copper-producing State of the country and had an output of nearly 450,000,000 pounds in 1915, an increase in quantity of nearly 57,000,000 pounds and in value of nearly $26,000,000. In the latter part of 1914 many of the copper mines had been closed or worked on a 50 per cent basis. As the price of copper increased in 1915 from 13.60 cents a pound in January to 19.75 cents in June, mines and smelters took advantage of the rise in price and toward the end of the year were producing at more than the normal rate. Great increases were made at the smelting plants at the Calumet and Arizona, Copper Queen, United Verde, Hayden, International at Miami, and Consolidated Arizona at Humboldt. The new plant of the International S. & R. Co. was started the middle of the year and treated concentrates from the Miami Copper Co. The new smelter of the United Verde was blown in May 18 and the old smelter closed August 21. On account of floods in April, the Old Dominion plant did not increase its output for the year, and on account of the strike in the Clifton-Morenci district in September, the output of the Detroit, Arizona Copper, and Shannon smelters was greatly decreased. At the Inspiration property the new mill using concentration and flotation was treating 5,000 tons a day in October. The Ray Consolidated, during the first three-quarters of the year, produced nearly 44,000,000 pounds of copper, or at the rate of a little less than 5,000,000 pounds a month.

LEAD SHOWS GAIN

The mine output of lead in Arizona increased from 15,00[illegible] pounds in 1914 to about 22,272,000 pounds in 1915, an increase of over 48 per cent. The value increased from $585,120 to $1,0[illegible]. The greater part of this output comes from the Copper Queen and Shattuck properties, in the Warren district, in Cochise County. The Tennessee mine, in Mohave County, produced a lead-zinc ore, treated at Needles, from which lead concentrate and zinc concentrate were shipped.

The mine production of zinc, estimated as recoverable spelter, increased from [illegible] pounds in 1914 to about 17,720,000 pounds in 1915, an increase of 81 per cent. The annual average price of zinc for 1915 gives a value of about $2,524,000 to this product. It came almost entirely from the Golconda and Tennessee mines in Mohave County. A few other zinc shipments were made from Pearce and Hereford, in Cochise County; Casa Grande, in

Pinal County; Red Rock, in Pima County; and Crown King, in Yavapai County. The Texas Arizona property, in the Cochise district, and the Duquesne property, in Santa Cruz County, also made a few shipments of zinc ore.

For the first eleven months of 1915 the metal mines of Arizona contributed nearly $11,000,000 in dividends. The principal dividend payers were the United Verde, Miami, Calumet and Arizona, Ray Consolidated, Superior and Pittsburgh, Old Dominion, Shattuck, Azirona Copper, United Globe, Tom Reed, and Magna.

CALIFORNIA OIL MEN'S PROTEST CONVINCES MANY

The delegation of Pacific coast business men who have been in Washington since the opening of Congress, asking for legislative relief from the impossible conditions in the California oil region, is deserving of prompt attention, says the Washington Times. Seemingly everybody who has taken the trouble to make even cursory examination into the merits of their case, has been convinced. Congress ought to act just as quickly as measures can be formulated that will assure both the public interest and the business concerns of the oil producers.

It is not worth while now, to discuss the responsibility for the unfortunate conditions in California. More than six years ago President Taft, acting doubtless on what at the time was supposed to be good advice and in the public behalf, issued an order withdrawing a great area of oil lands from entry. Many of these lands had been taken up under the placer law, and were in process of development. The withdrawal order broke down all certainties as to title, made it impossible to secure credit based on values known to exist, destroyed the market for the oil produced, and pitched the whole business into confusion.

If any real public interest had been served by this act there would have been excuse for letting bad conditions continue indefinitely, as they have done. But in fact the oil field is in more danger of being ruined than of being conserved. There is great danger that surface waters will work their way into the oil-bearing strata and "drown out" the field. Once opened, the wells must be continuously pumped, or they may become the means to ruin of the entire area.

There was a time when this condition was not well understood, and when suspicion attached to every effort at relieving the industry. Anybody connected with oil was presumed to be trying to rob the Government or the people; to get something for nothing and then sell it for several prices. Fortunately that attitude is no longer generally entertained. Something like real intelligence is beginning to be employed in consideration of such conditions as those in California; and it ought to be safe for Congress to deal honestly and directly with these conditions. California and the whole country actually need relief. The present session ought to provide it without delay.

URGES COOPERATION AMONG MINERS AND THOSE IN OTHER PURSUITS

In an address before the Arizona Chapter of the American Mining Congress recently, Andrew Kimball said in part:

"Thus through cooperation, home industry, economy and careful management through this early training, our neighbor State on the north—Utah—is today manufacturing over $70,000,000 worth of various articles, and her people are becoming wealthy from these industries.

"Not alone home industries, mining has made more money for Utah than anything else. A prominent Utonian, recently my guest, said to me, 'The marble fronts of the palatial homes of Salt Lake have come from the earnings of mines, and were it not for the proceeds of the rich and valuable mines about Salt Lake, we would be wading through muddy streets yet in some places. Mines have made possible these improvements. The laws of Utah encourage mining.'

"What we need in Arizona more than anything else today is the get-together spirit, home industries, patriotism, loyalty to State and her interests. To bring this about—let me venture some suggestions:

"Agriculture is the foundation of any commonwealth and without a foundation there can be no firm superstructure. The leaders of the people who laid the foundation of the settlement of this western world, struck it right when they held the people together in agricultural pursuits. In Arizona we must encourage agriculture, thereby get a stable population. A class of conservative home-building people, taxpayers, a population of responsible and intelligent citizens. This will do it. Agencies with which to do this are such as the Arizona Chapter of the American Mining Congress, and the State Taxpayers' Association of Arizona, and other like organizations.

"I am not a miner, but I have a place with this organization. There is nothing more helpful to agriculture than a good market. When the mines do well, the farmer can sell his produce, the stockman his meat, the horticulturist his fruit, the creamery its butter and cheese. Our mills and factories have business. Everything about a farming community means for the best when the mining interests are up and doing well. Then as a farmer and associated in the colonizing business, my life work is among the tillers of the soil. Then I am in my line of duty, as I see it, when I lend my influence along the lines of development of the mining industry."

Assistant Metallurgist Needed.

Civil service examinations will be held January 25 at various points throughout the United States for an assistant metallurgist to fill a vacancy in the Bureau of Mines. The salary for the work involved ranges from $1,800 to $3,000 a year.

CRIPPLE CREEK INCREASES ITS GOLD OUTPUT BY MORE THAN $1,500,000

Colorado's Metal Mines Make Remarkable Showing during 1915—Gold Output for the State Passes $22,000,000 Mark—Silver Output Decreases

The mine output of Colorado metals for eleven months of 1915, with an estimate for December, from data compiled by Charles W. Henderson, of the United States Geological Survey, indicates a yield for the year of $22,330,000 in gold, 7,080,000 ounces of silver, 66,664,000 pounds of lead (in terms of lead in lead bullion and lead in leaded-zinc oxide), 7,100,000 pounds of copper, and 100,000,000 pounds of zinc (in terms of spelter and zinc in zinc oxide), with a total value of $43,100,000, compared with $19,883,105 in gold, 8,796,065 ounces of silver, 74,211,898 pounds of lead, 6,639,173 pounds of copper, and 96,774,960 pounds of zinc, with a total value of $33,460,126 in 1914. This shows an increase of $2,447,000 in gold, decrease of 1,716,000 ounces of silver, and 7,550,000 pounds of lead, an increase of 306,000 pounds of copper, and 3,200,000 pounds of zinc. With the increased average value of metals, except silver, the values show a decrease of $1,380,000 for silver, an increase of $300,000 for lead, an increase of $340,000 for copper, and an increase of $8,065,000 for zinc.

The tonnage treated by the Globe, Leadville, Pueblo, Durango, and Salida smelters was approximately the same as in 1914. Increased shipments of copper ore were made from Rico to plants in Utah and copper matte was shipped from Ouray to Utah. Cyanide precipitates and copper ore were shipped to Omaha. Some Rico ore was shipped to San Pedro, New Mexico. The matting plant at Ouray was operated during the greater part of the year. The tonnage treated at the United States Zinc Co.'s magnetic-wet concentration mill and smelter at Pueblo showed a heavy increase. The Western zinc oxide plant at Leadville was placed in successful operation in April and operated throughout the year on Leadville zinc carbonates.

CRIPPLE CREEK BREAKS RECORD

The gold output of Cripple creek (Teller County) was $13,539,245, an increase of $1,543,129. The yield was also $507,328 larger than the 1908 yield, which was the largest yearly output since 1906. Cripple Creek, to the end of 1915, has produced $272,326,000. The Roosevelt tunnel continued to lower the water in the mines, except in the Vindicator-Golden Cycle, where electric pumps are used. Several shafts were extended to the depth of 1,900 to 2,000 feet. Work on the extension of the tunnel stopped November 4, 1914, when the El Paso plant was destroyed by fire, was resumed March 2, 1915, the tunnel then being 17,127 feet long. Toward the end of the year the tunnel was approaching the Elkton property and the flow was in excess of 15,000 gallons per minute.

The Golden Cycle cyanidation mill at Colorado City, and the Portland cyanidation mills at Colorado Springs and Victor, were operated steadily with an increased output. The Stratton's Independence mill was included in the sale of the mine to the Portland Company. The Union cyanidation plant at Florence was idle and the smaller plants in the district were not as actively worked as heretofore. The tonnage of smelting ore increased appreciably. The discovery of a body of exceptionally high grade ore in the Cresson mine in December, 1914, resulted in a greatly increased output of the district for the first quarter of the year 1915.

Lake County, chiefly from Leadville, but also including the Lackawanna Gulch and St. Kevin lode districts and the Arkansas River dredge district, produced $2,261,000 in gold, 2,660,000 ounces of silver, 20,000,000 pounds of lead, 1,840,000 pounds of copper, and 71,000,000 pounds of zinc, with a total value of $14,000,000, against $1,571,451 in gold, 3,810,830 ounces of silver, 26,784,615 pounds of lead, 2,382,910 pounds of copper, 78,764,334 pounds of zinc, with a total value of $9,057,297 in 1914. Metallic gold was shipped during the year from the Ibex and Third Venture mines. The output of zinc carbonate was 80,000 tons of 22 per cent zinc, against 113,881 tons of 24.3 per cent in 1914. The zinc sulphide smelting ore and concentrating ore combined was 133,000 tons of 24 per cent zinc, as compared with 111,947 tons of 21.2 per cent zinc in 1914. Operations were resumed in April at the 50-ton zinc oxide plant, and it was operated successfully during the year on zinc carbonate ores of 16 per cent or less. The Pingree flotation plant was operated on zinc-lead sulphide ores from Leadville and Red Cliff. The water in the down-town mines was lowered by electric pumps to nearly 700 feet at the Penrose shaft. The Derry Ranch dredge, below Malta, began operations in October and thence on regular shipments of bullion were sent to the Denver Mint.

SAN JUAN RICH IN MINERALS

The San Juan region of Dolores, La Plata, Ouray, San Juan, and San Miguel Counties produced $3,890,000 in gold, 2,250,000 ounces of silver, 13,800,000 pounds of lead, 3,420,000 pounds of copper, and 4,000,000 pounds of zinc, as compared with $3,909,857 in gold, 3,515,437 ounces of silver, 11,803,760 pounds of lead. 2,379,639 pounds of copper, and 1,382,334 pounds of zinc, in 1914. There were increases for gold of $3,700 in Dolores, and $68,500 in San Juan County, but decreases of $51,400 in La Plata, $37,500 in Ouray, and $25,800 in San Miguel. There were increases for silver of 36,000 ounces in Dolores, but decreases of 13,000 ounces in La Plata, 2,000 ounces in Ouray, 95,000 ounces in San Juan, and 191,000 ounces in San Miguel. Dolores County (Rico) showed an increase of 630,000 pounds of copper, but a decrease of 235,000 pounds of lead. Ouray County's yield of lead and copper showed little change. San Juan showed an increase of 1,400,000 pounds of lead, and 200,000 pounds of copper, and San Miguel County showed an increase of 960,000 pounds of lead and 340,000 pounds of copper. The Sunnyside Mine of San Juan County made a greatly increased output of zinc concentrates in 1915, and the Smuggler Union Mine, of Telluride, began shipping zinc middlings in large tonnages in January, 1915. No zinc middlings were shipped from the Tomboy group in 1915.

Boulder County's production was $165,000 in gold, 264,000 ounces of silver, 820,000 pounds of lead, and 70,000 pounds of copper—an increase of $66,000 in gold, a decrease of 48,000 ounces of silver, an increase of 294,000 pounds of lead, and an increase of 45,000 pounds of copper.

Chaffee County produced $322,000 in gold, 235,000 ounces of silver, 3,678,000 pounds of lead, 306,000 pounds of copper, and 3,670,000 pounds of zinc—a slight decrease for all metals, except zinc, for which there was an increase of 1,500,000 pounds.

Clear Creek County's output was $547,000 in gold, 376,000 ounces of silver, 2,370,000 pounds of lead, 560,000 pounds of copper, and 1,500,000 pounds of zinc—an increase of $52,000 in gold and 30,000 ounces of silver, 190,000 pounds of copper, but a decrease of 62,000 pounds of lead, and an increase of 500,000 pounds of zinc.

Gilpin County's output was $559,000 in gold, 130,000 ounces of silver, 544,000 pounds of lead, and 420,000 pounds of copper, including ore mined through the Argo tunnel.

The Pitkin County (Aspen) yield was 411,000 ounces of silver and 19,000,000 pounds of lead—an increase of 40,000 ounces of silver, but a decrease of 4,350,000 pounds of lead.

CREEDE SHOWS GAINS

Creede (Mineral County) produced $35,400 in gold, 308,000 ounces of silver, 2,400,000 pounds of lead, 13,000 pounds of copper, and 200,000 pounds of zinc—an increase of $16,000 for gold, a decrease of 300,000 ounces of silver, but an increase of 1,000,000 pounds of lead and 200,000 pounds of zinc. The tonnage of crude ore shipped from Creede decreased, but the operation of the Humphreys mill (idle in 1914) increased the yield of lead and zinc. A considerable quantity of zinc concentrates has been stored.

Hinsdale County's production was not large but showed an increase for silver and lead, and an improvement in activity in considerable contrast to a practical idleness in 1914.

With the revival of gold mining at Ohio City and the discovery and operation since July of a large deposit of zinc carbonate at the Doctor Mine, in the Elk Mountain district, with shipments of zinc sulphide from Whitepine, Gunnison County yielded $55,000 in gold, 23,000 ounces of silver, 220,000 pounds of lead, and 1,800,000 pounds of zinc—an increase of $42,000 in gold, a decrease of 36,000 ounces of silver, a decrease of 94,000 pounds of lead, but an increase of 1,300,000 pounds of zinc. Shipments of copper ore began in October from the old Vulcan property, at Vulcan. The dredge at Tincup, moved in 1914 from Riverton, Wyoming, and operated for a time in 1914, was idle in 1915.

Summit County's production was $644,000 in gold, 60,000 ounces of silver, 1,760,000 pounds of lead, and 9,000,000 pounds of zinc, as compared with $668,610 in gold, 67,009 ounces of silver, 1,565,231 pounds of lead and 5,111,941 pounds of zinc—a small decrease for gold and silver, a small increase for lead, but a very large increase for zinc. The four dredges at Breckenridge produced about the same yield of gold as in 1914, and the zinc shipments from Breckenridge increased heavily. Some lead and zinc shipments were also made from Kokomo and Montezuma.

Eagle County produced $98,000 in gold, 172,000 ounces of silver, 1,232,000 pounds of lead, 60,000 pounds of copper, and 10,500,000 pounds of zinc, as against $51,245 in gold, 127,080 ounces of silver, 1,177,385 pounds of lead, 28,105 pounds of copper, and 7,522,098 pounds of zinc in 1914, an increase for all metals, particularly for zinc. All the ore came from Red Cliff, the Brush Creek district being idle.

Park County's placer output decreased, but the yield of the lode mines increased appreciably, the total yield being $153,000 in gold, 8,500 ounces of silver, 177,000 pounds of lead, and 11,000 pounds of copper—the most important item of interest being an increase of $85,000 in gold, due mainly to activity at the London mine, at the head of Mosquito Creek.

Custer County produced $4,300 in gold, 32,000 ounces of silver, 86,000 pounds of lead, 17,000 pounds of copper—an appreciable increase for all metals. Fremont County continued to yield an appreciable quantity of copper and heavily increased its zinc yield. Garfield County made an increased yield of gold. Operations at the Bonanza Mine, Summitville, Rio Grande County, resulted in an appreciable production of gold. Saguache County mines were not as active as in 1914.

Charles S. Keith, of Kansas City, Mo., director of the American Mining Congress, was in Washington to attend the meeting of the Mining and Metallurgical Society and other meetings during last month.

IDAHO'S METAL MINE YIELD INCREASES FIFTY THREE PER CENT IN 1915

Principal Gain Is Made in Copper, Lead, and Zinc—Over $500,000 in Gold Recovered from Dredging—Gold and Silver Output Almost Unchanged During Year Just Closed

The United States Geological Survey reports that the output of gold, silver, copper, lead, and zinc from ores sold or treated from Idaho mines in 1915 had a total value of about $37,780,000. This is an increase of more than 53 per cent over the production of 1914, which was valued at $24,645,848. There was no great change in the output of gold and a slight increase in that of silver, but there were material increases in the production of copper, lead, and zinc, especially of zinc. The increase in the total value of these metals, amounting to over $13,000,000, was due largely to the increased price of lead and zinc. These estimates are reported by C. N. Gerry, statistician, at the Salt Lake City office of the Survey.

The mine production of gold was nearly the same as that of 1914, valued at $1,152,315. The yield of gold from dredging was over a half million dollars, but no more than during 1914. The Boston Idaho, in Boise County, and the Idaho Power Co., in Clearwater County, were the main contributors. The American Placer Mining Co. merely tested the machinery of their new plant at Pierce. There was an increase in gold yield from copper ore, particularly from the Empire Copper mine at Mackay, which had a record production of ore. Deposits of gold bullion at the Government assay office were greater than in 1914. In Elmore County, the Atlanta mines and the old Bagdad Chase property, now operated by the Boise Rochester Mining Co., produced bullion. In Owyhee County the Silver City M. & M. Co. was operating a 10-stamp mill.

INCREASE IN SILVER

The production of silver from Idaho mines increased from 12,479,516 ounces in 1914 to about 13,000,000 ounces in 1915, or more than 4 per cent. The price of silver, however, was comparatively low and the value of the output was over $400,000 less than in 1914. The shipments of silver-lead ore and concentrates, which contained the greater part of the silver, decreased in the early part of the year, but increased considerably toward the end of the year, when the price of lead was over 5 cents a pound and that of silver was 56 cents an ounce. A considerable part of these increased shipments will not reach the smelters until 1916. The Hercules mine, which produces much silver, was idle for three months during the year on account of a controversy with the smelting company. The largest increase in silver output came from the Caledonia mine. Other properties which increased their production of silver were the Federal, Bunker Hill, Hecla, Gold Hunter, Tamarack and Custer, and Ontario, all in Shoshone County. The lead mines at Gilmore and the copper property at Mackay increased their output of silver.

The output of copper from Idaho was increased from 6,445,186 pounds in 1914 to about 7,169,000 pounds in 1915. As the Snow Storm mine at Larson is no longer a large producer, and as the Lost Packer mine at Ivers, shipped only a few cars of matte, the increase was due almost entirely to unusually large shipments from the Empire Copper Co., at Mackay, in Custer County, which, in the middle of the summer, was shipping at the rate of about 9,000 tons a month. The National Copper Co. did not mill any ore, but a large amount of copper ore was said to be developed in the Horst-Powell property on the Little North Fork, north of Kellogg.

LEAD PRINCIPAL MINERAL

The mine output of lead, which is the main mineral product of Idaho, increased from 348,526,069 pounds in 1914 to about 377,000,000 pounds in 1915. A large part of this output, however, had not reached the smelters at the close of the year. This is an increase of over 8 per cent in quantity and nearly $4,000,000 in value. Nearly all the large mines of the Coeur d'Alene region produced more lead in 1915 than in 1914 on account of the efforts to market the ore the last half of 1915. This was true also of the Wilbert Mining Co., in Fremont County, and the Pittsburgh-Idaho and Latest Out properties at Gilmore, in Lemhi County. The Idaho Continental mine, in Boundary County, formerly Bonner County, was sending lead product to Porthill by tractors when work was interrupted by the burning of the mill on July 30. A new mill was being constructed at the H. E. M. property northwest of Wallace. At the Marsh mine and mill improvements were made which have already increased the output. The smelting plant at Northport, Washington, was acquired during the year by some of the operators of Wallace, Idaho, and it is rumored that the ores of the Tamarack and Custer and the Hercules may be treated at this plant. Another item of great interest to the operators of the district is the fact that the Bunker Hill and Sullivan Company has determined to enter the smelting business and may erect a plant near Wardner. The Yreka district, around Wardner, alone produced 169,500,000 pounds of lead against 162,471,235 pounds in 1914.

Shipments of zinc ore and concentrate from Idaho mines increased from 54,754 tons in 1914 to about 97,000 tons in 1915. The shipments contained about 80,000,000 pounds of recoverable spelter, valued at over $11,000,000. On account of the unusual price for zinc in 1914, the zinc produced in the State was more valuable than the gold, silver, and copper combined. The increase in recoverable spelter, which amounted to over 90 per cent in quantity, came principally from the Consolidated Interstate Callahan, Success, Morning, Greenhill, Cleveland, and Hercules. Other shipments were made around Murray, from the Terrible Edith, Paragon, Monarch, and Bear Top and Oro Fino; in the western part of the district, from the Highland Surprise and Constitution; and in Blaine County, from the Minnie Moore, Nay Aug, and United Lead and Zinc. A new deposit of zinc, from which a shipment of oxidized ore was made in December, was opened on the Deer Ridge property, in the Black Pine district of Cassia County. The output of zinc and the unusual payment of dividends by the Interstate Callahan mine, situated north of Wallace, were notable in 1915. During the third quarter of the year this property shipped 15,000 tons of ore and concentrate, principally zinc product, containing over 1,000,000 pounds of lead and 13,500,000 pounds of gross zinc. For the fourth quarter the rate was increased about 50 per cent. The tramway was completed from the mill to Sunset and the mill was considerably enlarged. The Success mine increased its output of both zinc and lead concentrates. The Frisco mill produced a large quantity of zinc concentrates. At Pine Creek considerable zinc ore was opened up and shipments will also be made from the Little Pittsburg property, as well as the Constitution. The Ray Jefferson, which lies west of the Interstate Callahan property, in the Beaver district, is reported to show a considerable deposit of lead-zinc ore.

The principal dividend payers in 1915 were the Consolidated Interstate Callahan, Hercules, Bunker Hill and Sullivan, Caledonia, Federal, Hecla, Stewart, and Success, which will pay in all nearly $9,000,000.

TEXAS INCREASES OUTPUT OF ITS METAL MINES

The output of Texas mines for eleven months of 1915, with an estimate for December, from preliminary figures reported by Charles W. Henderson, of the United States Geological Survey, amounted to $2,500 in gold, 705,000 ounces of silver, 250,000 pounds of lead, 50,000 pounds of copper, and 33,000 pounds of zinc, as compared with $234 in gold, 530,817 ounces of silver, 149,027 pounds of lead, 23,760 pounds of copper, and 216,451 pounds of zinc in 1914. The greater part of the output of silver came from the Presidio silver mine and cyanidation mill, in the Shafter district, Presidio County. Some silver and copper were produced at Van Horn, Culberson County, and some lead and zinc in the Sierra Blanca District, El Paso County.

WAR RESPONSIBLE FOR MOST U. S. ANTIMONY PRODUCTION

Antimony ores are found in commercially valuable quantities in this country in the States of Arkansas, Nevada, California, Montana, Idaho, Washington, and Oregon. Of these States the most important as producers of antimony ores are Nevada and California. Antimony ores are also found in a number of places in Alaska. The quantities of ore are large, but most of them are distant from transportation lines. Wages are high. The price of antimony generally has been low. The deposits are irregular and spotted so that what might be termed large deposits in other countries might not be considered so in this country.

No antimony has been produced in this country for a number of years except that which is contained in antimonial lead and a very few tons produced as a by-product in the electrolytic refining of lead and copper. Antimony is imported mainly from England and China. Small quantities also probably come from France, Japan, Hungary, and possibly one or two other countries.

During the present year many antimony deposits are being worked and a considerable production is being made owing to the very high prices which have prevailed during the whole year.

Antimony is being smelted in the United States by the Chapman Smelting Company, San Francisco, Cal., and the Merchants' Finance Co., at Industrial Harbor (a part of Los Angeles near San Pedro Harbor), Cal. Smaller quantities of domestic antimony ores are smelted in connection with lead ores by the Hoyt Metal Co., St. Louis, Mo., and the Pennsylvania Smelting Co., Pittsburgh, Pa., in the making of antimonial lead. Neither of the companies are, however, regularly in the market.

The smelting of antimony ores is described in the following works:

Handbook of Metallurgy, by Schnabel, Carl, translated by Henry Louis, volume 2, 1907, published by Macmillan Co., New York and London, pages 551 to 597.

The Metallurgy of the non-ferrous metals, by William Gowland, published by Charles Griffin Co., London, 1914, pages 438 to 456.

Antimony, its history, chemistry, mineralogy, geology, metallurgy, uses, preparations, analyses, production and valuation, with complete bibliographies, by Chung Yu Wang. London and Philadelphia, 1909, 217 pages; published by Charles Griffin Co., London.

UTAH'S METAL OUTPUT REACHES $55,000,000 DURING YEAR JUST CLOSED

One-fourth More Ore Mined than Last Year—Increase in Value of Products is $18,000,000—Bingham Alone Produces 8,000,000 Tons More than in 1914

Mines in Utah produced gold, silver, copper, lead, and zinc in 1915 amounting in value to $55,000,000, as estimated by V. C. Heikes, of the United States Geological Survey. This represents an increase over the production in 1914 of nearly 50 per cent, or $18,000,000. There was a considerable increase in all the metals. About one-fourth more ore was mined, increasing the total from 8,544,014 tons in 1914 to about 10,725,000 tons in 1915. About 9,900,000 tons were produced at Bingham, an increase from 7,800,661 tons in 1914. The bulk of this ore was mined at the Utah and Ohio Copper properties, which yielded about 9,000,000 tons of low-grade ore in 1915. Other mines that contributed large quantities of ore were the Utah Consolidated, Utah Apex, United States, Bingham, Bingham New Haven, and Utah Metal mines. The Tintic district produced about 290,000 tons, against 298,486 tons in 1914. The main ore producers were the Chief Consolidated, Iron Blossom, Centennial-Eureka, Eagle and Blue Bell, Mammoth, Gemini, Grand Central, and May Day mines. The 100-ton concentration mill, built primarily to treat Chief Consolidated ores, did considerable custom work.

In the Park City region about 99,795 tons of crude ore and concentrates were shipped, against 66,736 tons in 1914. Improvements in concentration methods resulted in large shipments of lead and zinc concentrate from the Daly Judge, Daly West, and Silver King Coalition mills. Two large concentration mills were built for treating tailings on the flats below Park City. Flotation was adopted at several mills in the region, and the prospect is that all the mills will be similarly equipped in 1916. In Beaver County the ore shipments, including a considerable quantity of old slag, amounted to about 38,000 tons, against shipments of 32,695 tons in 1914, principally from the Horn Silver and Majestic mines. In Tooele County the ore production, principally from Stockton and Ophir, increased from 58,871 tons to 65,374 tons in 1915. There were 26,077 tons of ore hauled from the Cottonwood districts to the smelters in 1915. The largest producer was the Cardiff mine, which yields rich lead-silver ore. Important shipments of silver ore were made from the South Hecla and the Michigan-Utah properties. Zinc ore was shipped from the Carbonate mine.

GOLD FROM BULL VALLEY

The mine output of gold increased over 19 per cent—from $3,265,347 in 1914 to $3,908,000 in 1915. Copper ores yielded the larger part of the gold, but large quantities also came from lead ore and siliceous ore. A comparatively small quantity of copper ore was produced in gold and silver mills. High-grade gold ore was mined in the Bull Valley district of Washington County during part of the year, and in the last half of the year new developments in the Fortuna district of Beaver County attracted attention, and wide veins of low-grade gold ore are said to be systematically exploited. At the same time small high-grade veins of gold ore are being mined and milled by lessees.

The mine production of silver increased from 11,154,916 ounces in 1914 to approximately 12,724,000 ounces in 1915, the increase amounting to 14 per cent in quantity and about $169,000 in value. Much of the silver is derived from lead ore, and smaller quantities from the copper and siliceous ores. Early in the year the Knight-Christensen chloridizing, roasting, and leaching mill was destroyed by fire, and during the summer was being reconstructed at Silver City by the Tintic Milling Co., which dismantled a similar plant at Park City that was recently used to treat Ontario ores. The new plant will probably be in operation early in 1916.

The copper output from Utah mines increased from 152,031,002 pounds in 1914 to about 182,589,000 pounds in 1915, the increase amounting to more than 20 per cent in quantity and about $11,450,000 in value. The gain was made mostly by the Utah Copper mine at Bingham which is credited with an increase of 34,207,552 pounds over the output of 1914. Low-grade porphyry ore was produced from the Utah Copper property and a smaller quantity from the Ohio Copper mine. The Cactus mine, in southern Utah, was not operated, but preparations were being made by a leasing company using the flotation process to retreat the Cactus tailings, which are reported to carry 14 pounds of copper per ton. The Ohio Copper mine and mill, after going into the hands of a receiver, were for a long time idle, but during the last half of the year were being operated by lessees.

LEAD INCREASED 28 PER CENT

The mine production of lead increased from 171,393,137 pounds in 1914 to 219,008,000 pounds in 1915, or about 28 per cent, mostly from the Bingham district, where the Utah Apex, Utah Consolidated, United States, and Bingham New Haven were the largest producers. In Park City the Silver King Coalition, Daly West, Daly Judge, and Silver King Consolidated added to the total output. In the Cottonwoods the mines produced over 12,000,000 pounds of lead, a large part of it coming from the Cardiff property.

With the advance in prices, zinc ore was offered from many sources. The mine production of zinc recoverable as spelter aggregated 22,643,000 pounds, valued at about $3,224,000. This is an increase of about 41 per cent in quantity over the output of 1914, amounting to 15,989,267 pounds. The largest shipments of zinc concentrates were made from the Midvale mill of the United States Mining Company, which treated some custom ore besides that handled from its own property at Bingham. The Daly Judge mine, at Park City, was the next largest producer of concentrates, followed by the Daly West and the mills recovering zinc from the old tailings lodged on the flats below Park City. Promontory district, in Box Elder County, became prominent in zinc production from the Lake View mine, which is credited with 3,446,916 pounds of zinc figured as recoverable spelter. New zinc deposits were also opened near Hyrum in Cache County and Woodside in Emery County, each district producing several cars of crude zinc ore. Altogether there were 38 producers of zinc ore in Utah in 1915.

All the smelting establishments were operating at full capacity soon after the first of the year. These were the Murray, Midvale, International, and Garfield plants.

Dividends amounting to about $9,000,000 were distributed by Utah mining companies in 1915, as against $7,431,017 in 1914.

ARIZONA CHAPTER REELECTS ITS OFFICERS AND DIRECTORS

Four hundred and seventy-one members are enrolled on the books of the Arizona Chapter of the American Mining Congress. This and many other interesting facts were brought out at the annual meeting of the Arizona Chapter, which was held in Phoenix, December 6.

With the exception of two new directors, which were added, all the old officers and directors were re-elected. The complete list of the officers and directors of the Arizona Chapters is as follows:

W. B. Twitchell, governor, Phoenix; E. M. Murphy, first vice-governor, Prescott; C. A. Grimes, second vice-governor, Pasadena, Cal.; and W. B. Gohring, third vice-governor, Warren.

Directors were elected as follows: J. P. Hodgson, Bisbee; Norman Carmichael, Clifton; A. J. Pickrell, Prescott; T. A. Riordan, Flagstaff; O. D. M. Gaddis, Kingman; W. H. Clark, Holbrook; L. S. Cates, Ray; B. Britton Gottsberger, Miami; Pat Rose, Globe; Wm. McDermott, Tucson; Con O'Keefe, Nogales; J. C. Goodwin, Tempe; Andrew Kimball, Thatcher; and D. A. Burke, Bouse.

W. B. Twitchell presided at the meeting.

Besides the directors present there were 108 members present either in person or by proxy.

Mr. Twitchell gave a brief history of the organization of the Chapter, and also stated what had been accomplished in the past year.

The report of J. H. Robinson, the secretary, was read. It showed 471 members enrolled, and a cash balance of $281.75 on hand December 1. The data gathered through the efforts of the secretary was the source of favorable comment.

On motion of Mr. Willis, which was carried unanimously, the membership fee was reduced from $5 to $3 per annum. Of the amount so collected $2 is to be sent to the American Mining Congress for association membership and for the MINING CONGRESS JOURNAL, and $1 is to be retained by the chapter for membership dues.

Mr. Willis, together with Mr. Twitchell, were selected as a committee to draft resolutions of thanks to Patrick Rose for the interest he has taken in the chapter in securing memberships and promoting the mining industry in this section.

Mr. Twitchell was selected unanimously as a delegate to the Mining and Metallurgical Society meeting in Washington.

Papers by President Andrew Kimball, Professor Willis, director of the School of Mines of the State University at Tucson, and C. S. Scott, of the *Arizona Magazine,* were read.

After adjournment the board of directors met and selected B. Britton Gottsberger, of Miami; J. P. Hodgson, of Bisbee, and W. B. Gohring, of Warren, as the executive committee, and H. J. McClung, of Phoenix, as treasurer. J. S. Douglas, of Douglas; S. W. French, of Douglas; W. B. Gohring, and Norman Carmichael, of Clifton, and Mr. Will L. Clark, of Jerome, were elected to compose the finance committee for the ensuing year.

The Executive Committee elected J. H. Robinson, of Prescott, secretary for the ensuing year.

Prescott was selected as the headquarters of the chapter.

METALLURGY OF TUNGSTEN ORES TREATED IN GERMAN WORKS

The U. S. Geological Survey has issued no literature bearing upon the reduction of tungsten ores. The work of the Survey is confined almost wholly to the geology of mineral deposits so that such information as it has upon the reduction of ores is largely incidental.

The metallurgy of tungsten ores is treated in the following works:

Die Metallurgie des Wolframs mit besonderer Berücksichtigung der Elektrometallurgie sowie der Verbindungen und Legierungen des Wolframs samt seinen Verwendungen, Praktisches Handbuch von Dr. Hans Monnicke, Ing.—Chemiker, Berlin W., Verlag von M. Kryan, 1911.

Wolfram, Eine Monographie mit einem Anhang Die Patentansprüche über Wolfram-Glühkörper von Dr. Phil. Heinrich Leiser, Halle a. S., Verlag von Wilhelm Knapp, 1910.

SECRETARY OF LABOR REVIEWS WORK OF DEPARTMENT

Taking the past achievements of the Department of Labor as a criterion, Secretary William B. Wilson, head of that branch of the Government, declares in his annual report that the hopes of the sponsors for the infant department are in a large measure possible of fulfillment.

Reviewing the steps leading to the establishment of the governmental branch, and outlining the purposes of the department, Secretary Wilson says that up until July 1 last "the good offices of the department have been invoked and amicable adjustments effected in some seventy trades disputes, affecting directly or indirectly some 200,000 men and millions of dollars' worth of property. The amount of hardship and suffering and the property losses which have been averted are incalculable.

"An instance will convey an idea of the proportions which some of these controversies assume and the results which are frequently achieved through the intervention of the department. In April, 1914, the department was requested to intercede in an effort to find a basis of agreement in connection with a controversy which had arisen between the Great Lakes Towing Company and the Licensed Tugmen's Protective Association, and which threatened to result in the tying up of commerce in nearly every part of the great lakes.

"A representative was accordingly dispatched to the scene of the dispute and succeeded in bringing about an understanding between the interested parties. It is estimated that if the strike had been prolonged throughout a period of five weeks it would have entailed a direct property loss of some $3,000,000 and thrown out of employment more than 8,000 workmen. Through the department's efforts, however, it was brought to a termination after having run little more than one week."

Discussing the work of the division of information, the duties of which are to promote a beneficial distribution of admitted aliens and others by collecting and disseminating among them trustworthy data concerning opportunities for employment or settlement, he said:

"The department was prompt to recognize the possibilities which this statutory authority held out for the advancement of the wage-earners' opportunities for profitable employment, and immediately set about to perfect a nation-wide system of intelligence offices for the collection and dissemination of information as to where labor of all kinds was in demand. The farmers of the country quickly availed themselves of the department's services.

"The first large undertaking of this nature occurred in May, 1914, when requests began to pour into the department from the officials and farmers of Oklahoma, Kansas, Missouri and South Dakota for assistance in their efforts to procure harvest hands. Through cooperation with the postoffice authorities the department was enabled to give the widest publicity to the needs of these States, with the result that within a comparatively short time approximately 75,000 men were directed to employment, and the farmers were enabled to gather their wheat crop in due season.

"Hand in hand with the movements for the betterment of conditions of the wage-earners in the country has been the effort to improve the welfare of our children. The same spirit of enlightenment which resulted in the creation of the Department of Labor was responsible for the establishment of a federal children's bureau, which is inquiring into the causes of infant mortality, as well as other conditions surrounding and affecting the lives of our children. It endeavors, through its teachings, based upon facts disclosed by exhaustive investigations, to develop children into healthful, intelligent and useful citizens. In the field of child labor the bureau is rendering valuable service, and it is anticipated that its efforts in this direction will be effective in reducing or eliminating the evils which have crept into our complex system of industry and which have operated to deprive so many of our children of the opportunities for education and the development of sound and healthy bodies.

"The Bureau of Labor Statistics in engaged in the compilation of authoritative information concerning labor in the most comprehensive sense of that word, and especially with regard to its relations to capital, the hours of labor, the earnings of laboring men and women, and the means of promoting their mental, social, intellectual and moral prosperity.

"At the various immigration stations throughout the country which come under the jurisdiction of the Bureau of Immigration, much has been done in the way of humanizing the facilities for the reception of aliens. Female employes have been designated to exercise a careful supervision over unaccompanied women and girls and to guard them from the perils which constantly beset the unsophisticated women who arrive at our gates. At Ellis Island, through which the largest number of our immigrants come, notable results have been achieved. In its administration of the immigration laws, which bring before it all the ills and woes peculiar to the human race, the physical, moral and mental welfare of the immigrant is ever uppermost in the department's mind."

MAINE HAS TIN VEIN, BUT IT IS TOO LEAN TO BE WORKED

Tin has been found at Winslow, Me., in a small vein of no economic value. Occasional pieces of cassiterite have been found in the pegmatites at Mount Mica and Mount Tourmaline, but probably the entire quantity uncovered would not amount to more than a few pounds. The tin vein at Winslow is described by T. Sterry Hunt under the title "Remarks on an occurrence of tin ore at Winslow, Maine" in the Transactions of the American Institute of Mining Engineers, volume 1, 1873, pages 373 to 375.

MINERAL PRODUCTION IN ALASKA BREAKS ALL PREVIOUS RECORDS OF TERRITORY

While High Price of Copper was Principal Cause for Increase in Output of Northern Mines Much Development Work was Done During Last Twelve Months

The Alaska mining industry, as a whole, was more prosperous in 1915 than in any previous year. This is indicated by the value of the total mineral output, which is estimated to have been $32,000,000, compared with $19,064,963 for 1914. The highest value for any previous year was in 1906, when Alaska produced $23,378,428 worth of minerals, but this was at a time when the bonanza placers of Fairbanks and Nome were yielding their greatest returns.

The high value of the mineral output in 1915 was due in large measure to the extraordinary amount of copper that was mined. Preliminary estimates indicate this to be 83,850,000 pounds, valued at $14,400,000. In 1914 21,450,628 pounds of copper were mined, valued at $2,852,934. The gold production also increased in 1915, when the value was about $16,900,000, against $15,626,813 for the output of 1914. This is the largest gold production since 1912, when the output was valued at $17,145,951. As the production of silver is incidental to gold and copper mining, this also increased. It is estimated that $400,000 worth of silver was mined in 1915, against $218,327 worth in 1914.

The output of other minerals, including tin, antimony, marble, gypsum, coal and petroleum, in 1915 had a value of about $300,000, compared with $222,802 in 1914.

In addition to the productive mining a large amount of dead work was accomplished during 1915 on properties that made no output. Therefore the abnormally large value of the total mineral production must not be considered as simply a temporary expansion of the mining industry, due to the high price of copper. The developments made during the year give assurance of continued large operations in both copper and gold lode mining. Placer mining has been less prosperous, for this industry has not yet reacted to the stimulus of the Government railway, which will make available for profitable exploitation large bodies of low-grade gravels. The same is true of the coal-mining industry, which also must await railway transportation.

The first gold mining in Alaska was done in 1880, and since that time gold to the value of about $261,050,000 has been produced. Of this about $186,200,000 has been won from the gold placers. Copper mining began in 1901, and the total copper output of Alaska is now about 217,250,000 pounds, valued at $34,150,000. The value of the total silver production to date is about $2,650,000. Coal, petroleum, tin, lead, quicksilver, antimony, marble, gypsum, and other minerals have been produced to the value of about $2,150,000. Therefore, the value of the total mineral production during thirty-six years of mining in Alaska has been $300,000,000.

GOLD PLACER MINING

The data in hand indicate that the value of placer gold produced in 1915 was $10,500,000, compared with $10,730,000 in 1914. This decrease of output, if borne out by the final figures, is chargable to the falling off in the output of some of the Yukon camps. On the other hand, the developments in the Tolovana district, where gold was discovered in the autumn of 1914, indicate that this will become of some importance as a producer.

About forty-two gold dredges were operated in Alaska during 1915, the same number as in 1914. From the information at hand it appears, however, that the value of the gold recovered by dredges was less than $2,000,000 in 1915, compared with $2,350,000 in 1914. This falling off is chargeable to the Seward Peninsula districts, where about thirty-seven of the dredges are located. There can be no question that this decrease of dredge output is but a temporary check to the industry as a whole, and is due to certain local conditions. Several dredges that will be operated in 1916 are in process of installation.

GOLD-LODE MINING

About twenty-three gold-lode mines were operated on a productive basis in 1915, compared with twenty-eight in 1914. On the other hand, the value of the gold-lode output has increased from $4,863,028 in 1914 to about $6,200,000 in 1915. This increase is to be credited to the Juneau district, where large developments were continued throughout the year. There can be no question that the gold-lode output will increase at a rapid rate. This will be due not only to large-scale operations in southeastern Alaska, but also to the encouragement given to lode mining by the railway under construction from Seward to Fairbanks.

COPPER MINING

The tremendous increase in copper output during 1915 has already been noted. Nearly four times as much copper was produced as in the previous year, and the value was nearly five times as much. The copper was taken from fourteen mines, of which seven were in the Ketchikan district, four on Prince William Sound, and three in the Chitina district.

Though the high price of copper led to the reopening of some of the smaller mines in the coast region, yet it should be noted that the increased output was possible only because of the large developments that have been under way for several years. The advance of the Alaska copper-mining industry during the year may therefore be said to have been a normal development of the industry. It is, of course, true, however, that if it had not been for the high price of the metal, the output would have been considerably less. It augurs well for the future of the industry that the Alaska copper mines are now sufficiently developed to produce so large a tonnage.

TIN MINING

It is estimated that about two hundred tons of stream tin were produced in Alaska during 1915. Much the larger part of the tin came from the York district of Seward Peninsula. Here one tin dredge was operated throughout the season on Buck Creek. A new dredge was installed on the same creek during the summer and operated for a part of the season. No returns have yet been received from the two dredges operated in 1914 on Anikovik River, in the same district, but these were probably also operated. These two are working on placers carrying both tin and gold. Developments were continued on the Lost River lode-tin mine, and there was also some prospecting of other lode-tin deposits. There was, however, no production of lode tin.

The only other tin mining in Alaska during 1915 was done in the Hot Springs district of the lower Tanana Basin. Here considerable tin is recovered incidental to gold placer mining.

ANTIMONY

The high price of antimony in 1915 led to the mining of over eight hundred tons of stibnite ores in Alaska. Nearly seven hundred tons of this output came from the Fairbanks district, and the rest from Seward Peninsula. It is difficult to obtain any exact valuation of the stibnite ore shipped from Alaska. The evidence in hand indicates that the producer received from $1.25 to $1.75 per unit of stibnite. It is probably reasonable to estimate that the Alaska shipments sold for $86 a ton in San Francisco. This indicates a value of about $70,000 for the total shipments made in 1915.

Four antimony properties were operated in the Fairbanks district during 1915—the Scrafford, in the Treasure Creek Basin; the Stibnite, in the Eva Creek Basin; the Gilmer, in the Vault Creek Basin; and the Chatham Creek mine. All the operations were on a small scale. The mining consisted chiefly of making open cuts and digging out the ore, which occurs in shoots, kidneys, and irregular masses along zones of fissuring. Most of the ore was broken and hand-sorted, and no ore carrying less than 50 per cent of antimony was shipped. The average antimony content of the ore was probably 58 per cent. Considerable prospecting was also done on a number of other stibnite lodes in the Fairbanks district.

The ore was hauled to the railway by wagons and then sent by rail to Fairbanks and over the all-water route to San Francisco. The transportation companies offered a low freight rate to encourage the new industry.

Developments were continued on the Sliscovitch mine, in the Nome district. The ore from this property carries some gold, and the mine has been worked for gold. In 1915, however, the energies of the operators were directed toward getting out stibnite ore. Some stibnite was also mined at the Hed & Strand property, a few miles north of the Sliscovitch mine. The total ore shipped from Nome is reported to be 132 tons, but there is reason to believe that a considerably greater quantity was mined.

Stibnite is not an uncommon mineral in Alaska. The recent demand for antimony has led to the prospecting of a number of stibnite deposits within the Territory. Such work is reported in the Kantishna district, on Prince William Sound, and on Kenai Peninsula.

MINERAL FUELS

One coal mine was operated on Cook Inlet in 1915 to furnish lignitic coal to a local market. There was also a little mining at several other localities. Some investigations were made in the Matanuska and other Alaska coal fields by those who are contemplating making applications for leases. Meanwhile the General Land Office has made the subdivision surveys of the more accessible parts of the Bering River, Matanuska, and Nenana coal fields.

There were no important developments in the oil fields. Some oil was produced in the Katalla field. Oil seepages were found near Wainwright Inlet, in the extreme northwestern part of Alaska. This locality is probably a western extension of the oil belt indicated by a seepage previously known, near Smith Bay, on the north Arctic coast of Alaska.

VANADIUM BEING MINED IN COLORADO ONLY

The only deposit of vanadium ores now being mined in this country so far as is known to the Geological Survey is owned by the Primos Chemical Co., and is located at Vanadium, San Miguel County, Colo. All of the carnotite mines are, however, producers of vanadium-bearing minerals. The ore is all sold to manufacturers of radium and could not be sold for the vanadium alone. It is therefore only necessary to have the names of the radium manufacturers to get the names of the producers of vanadium from this source.

The Standard Chemical Co., Pittsburgh, Pa.; the National Radium Institute, Denver, Colo., and Dr. W. A. Schlesinger, Radium Refining Laboratories, Princeton, N. J., are such producers.

Traffic Developments of the Month

BAUXITE ORE

From the facts of record we conclude and find that the respondents have justified the proposed rates on bauxite to East St. Louis and to other points to which the same rate is named in the suspended schedules and also the proposed rate to Memphis, but we further conclude and find from the facts of record that the other rates proposed have not been justified. These findings, however, are without prejudice to or approval of the readjustment of rates to eastern points which it was announced at the hearing would be made.

Bauxite is produced in only four States in this country. More than 75 per cent of that production is in Arkansas, the other three States in which bauxite is produced being Georgia, Alabama, and Tennessee. Georgia ranks second in production, and Georgia and Alabama produce jointly from 12 to 18 per cent of the total production in the United States, the proportion varying from year to year. The total production has been gradually increasing. The production in 1914 was 219,318 gross tons, as compared with 52,167 gross tons in 1908. The Arkansas mines are practically within a circle not over thirty miles in diameter, and are near Little Rock. The protestants of record are the Aluminum Company of America, hereinafter called the aluminum company; Aluminum Ore Co.; American Bauxite Co.; the Republic Mining and Manufacturing Co.; the Globe Bauxite Co.; the Laclede-Christy Clay Products Co.; the Norton Co.; Superior Chemical Co.; and Water Softening & Purification Works, of Columbus, Ohio.

The Aluminum Ore Co. and the American Bauxite Co. are subsidiary companies of the aluminum company, and the Republic Mining and Manufacturing Co. is closely affiliated with that company.

Bauxite is also produced in various countries other than the United States, but principally in France, India, and South America. The bauxite produced in this country has thus far come in serious competition only with that from France. The imports of bauxite have fluctuated greatly. In 1911, 43,222 tons were imported; in 1912, 26.214 tons; in 1913, 21,456 tons; and in 1914, 24,844 tons. The protestants claim that the European war greatly cut down the importation in 1914.

While bauxite is usually called an ore, it has no specific listing either as an ore or a clay, but it has the appearance of clay. From bauxite is made the metal aluminum, sulphate of alumina, commonly called alum, fire brick, and alundum, which is used to make grinding wheels similar to emery wheels.

A carload of bauxite consists largely of lumps of various sizes, but some of the ore becomes finely powdered in handling. Box cars are required for the traffic, but cars of a high grade are not ordinarily used. The minimum weight is the marked capacity of the car, but in no event less than 40,000 pounds, and the average loading is shown to be 73,696 pounds, cars being usually loaded 9 per cent in excess of marked capacity.

It is claimed by the respondents that bauxite does great damage to the cars in which it is shipped, for the reason, as they assert, that the powdered bauxite pushes out the sides and ends of the cars; but the protestants deny this and it is not established by the evidence.

Justifies Some Increases

In the matter of pig iron rates from Virginia furnaces the commission's findings are summed up as follows:

1. Proposed increased carload rates on pig iron from Virginia furnaces to certain points in Pennsylvania, New York, and Maryland not justified.
2. Proposed increased rates to Pittsburgh and Pittsburgh rate points justified.
3. Proposed increased rates to West Virginia points justified.
4. Proposed increased rail-and-water rate to Boston not justified.

S. E. Calkins, of the Geological Survey, has been sent to San Diego County, Calif., with instructions to look at the molybdenum deposits there.

Reparation on Manganese

Reparation has been granted by the Interstate Commerce Commission to the E. J. Lavino Company against the Pennsylvania Railroad. The refund covers overcharges on a shipment of fifty-one cars of manganese ore from Baltimore to Niagara Falls.

MINING LEGISLATION TO BE PUSHED AT THIS SEASON

Congress at this session will take up a more comprehensive program of legislation affecting mining than ever before has been the case. Martin T. Foster, chairman of the Mines and Mining Committee of the House of Representatives, declares that he will make unusual effort to expedite the prompt handling of the meritorious bills which may come before his important committee. Mr. Foster is greatly interested in seeing provision made for a thorough revision of mining laws at this session of Congress.

Mr. Foster has a personal bill which provides for placing in the hands of the Bureau of Mines all purchases of Government coal. These purchases are only to be made after careful study has been made of the coal best suited to the use for which it is required.

CALIFORNIA RETAINS TITLE AS PREMIER GOLD PRODUCING STATE OF THE UNION

Its Record in 1915 Exceeds That of Any Year Since 1865, with One Exception—Placer Mines Are Producing Forty-four Per Cent of the Gold Yield of the State—Copper, Lead and Zinc Show Big Increase

California mines show a materially increased output in gold, silver, copper, lead, and zinc in 1915, compared with 1914, according to preliminary figures compiled by Charles G. Yale, of the United States Geological Survey. The mine figures for 1914 were $20,653,496 in gold, and 1,471,859 fine ounces of silver; the estimates for 1915 indicate an output of $22,860,590 in gold, and 1,974,529 ounces of silver, an increased of $2,207,094 in gold and 502,670 fine ounces of silver. California remains the premier gold-producing State of the country. The yield for 1915 is the largest in thirty-two years and with one exception, the largest in fifty-one years. There are about seven hundred producing metal mines in the State, about evenly divided between deep and placer mines. About 2,500,000 tons of ore are mined and treated in the State annually of an average value in all metals of $6.75 per ton. In value of all metals produced, Shasta is the leading county, while in value of gold output, Nevada, Amador, Yuba, and Sacramento are the leading counties in the order named.

Placer mining for gold, for years considered a decadent industry in California, has for the past eighteen years been growing in importance, until now the placer mines are producing 44 per cent of the total gold yield, the other 56 per cent coming from deep mines. This condition has been entirely brought about by the dredging operations, the gold-dredges now producing some 86 per cent of the placer gold. During 1915 there were sixty-seven gold dredges in California, of which six were closed down all or part of the time, and one was burned, leaving sixty active dredges. Of the idle dredges, one was being moved from Oroville to Shasta County, one from Oroville was rebuilt, and one in Shasta County was removed to new ground in the vicinity. A new one was built in Calaveras County. A large 16-cubic-foot bucket dredge is under construction for the Yuba Consolidated Gold fields, in Yuba County; and another one of equal capacity (to dig 70 feet below water line) is being built for the Marysville Dredge Company in the same county. Plans have been prepared for still another of the same size for the Yukon Gold Company in the same dredge field. The present tendency is toward extensive yardage in dredging operations so the new machines are much larger and more powerful than those built formerly. It is considered probable that for this reason the yield of dredge-gold in California will continue about the same for some years, even though the old and smaller machines discontinue operations.

There has been a distinct revival in all kinds of metal mining in the State in 1915, particularly in gold mining. The dredge men have begun operations on tracts formerly considered too small for this class of work, and numerous quartz mines have been reopened, while the older ones have been deepened with good results.

The silver output from the mines shows an increase in 1915, as compared with 1914, of 502,670 ounces. This is mainly derived from the smelting of copper, lead and zinc ores, although some silver is recovered in the mining of both quartz and placer gold.

The estimated mine yield of copper in California in 1915 is 44,098,552 pounds, as compared with 30,507,692 pounds in 1914, an increase for 1915 of 13,590,860 pounds. The larger proportion of this was derived from Shasta County, as usual, although Calaveras and Plumas counties contributed a liberal quantity and other counties made some yield.

The mine output of lead in 1914 was 4,251,923 pounds; in 1915 it is estimated at 6,346,319 pounds, an increase for the latter year of 2,094,396 pounds. Most of this is derived from the Southern counties of the State, particularly Inyo County.

The estimated zinc output of the State in 1915 is 11,443,925 pounds, against 389,471 pounds in 1914, an increase for 1915 of 11,054,455 pounds. This is the largest production of this metal ever made in California in one year. The greater proportion was derived from Shasta County, where one of the large copper smelters has installed a zinc sorting plant. Inyo County was also a large contributor to the zinc output of the State.

Mining Congress members are requested to advise the Washington office of any change of address. Copies of the MINING CONGRESS JOURNAL are being returned for want of a proper address. This applies to some of the first-class mail addressed to members.

AMERICA'S INDUSTRIAL GREATNESS DUE TO ITS HUGE MINERAL PRODUCTION

The United States Produces Forty Per Cent of the World's Coal and sixty-Six Per Cent of its Petroleum—All History Shows That Mineral Resources Are the Source of Power

Great importance was attached by the delegates and other mining men present at the Pan-American scientific conference to the address of Dr. George Otis Smith, director of the Geological Survey. Some of the striking points he made are as follows:

Patent reasons for America's industrial greatness—The country produces 40 per cent of the coal of the world; 66 per cent of the petroleum; 40 per cent of the iron; 60 per cent of the copper, and 32 per cent of the lead and zinc.

Wise use becomes a duty when anything can be used but once.

The development of mineral resources is a national duty.

Mineral wealth is the foundation of power.

Mineral exports are winning for the United States a new and larger place in the world market.

Metal mining has passed from the exploitation of bonanzas to the working of low-grade deposits.

For 1915 the Federal corporation tax on copper mines alone may total $1,000,000.

The public's direct share of the proceeds from mineral resources must not be so great as to affect unfavorably labor's opportunity or capital's incentive.

Because of the essential relation between the mineral resources of a country and its prosperity, there rests on the public a continuing obligation to the mining industry.

Since 1906 the average recovery from United States copper ores has decreased from fifty pounds of metal per ton to thirty-two pounds. This change is due more to the improvement of methods than to the exhaustion of the richer deposits.

The day of large opportunity for exploration and investigation of the mineral resources of this country is not past.

Dr. Smith's address follows in its entirety:

A nation's mineral wealth may benefit its citizen body in two ways—as a source of direct revenue to the State and as a basis of industrial development. The task of placing the true social value upon mineral resources therefore involves the determining of the extent to which these two methods of serving the public interest are in harmony and, if they chance to be opposed, then the weighing of the alternative benefits.

Mineral wealth as an expendible resource rightfully commands the attention of the patriotic citizen, whether he be lawmaker or landowner, geologist or chemist, capitalist or mineworker. Wise use becomes a duty when anything can be used only once; and if full utilization means much to society, individual rights whose exercise involves anything less than full utilization must be subordinated to the public interest. In a democracy, therefore, the use of a mining property should serve the many, not the few. Thus, the development of mineral resources is of nation-wide value and the promotion of their best use properly becomes a national duty.

NATIONAL ASSET

A nation's store of mineral deposits is a national asset, whose value cannot easily be overestimated. In his recent report to the President, the Secretary of the Interior, in speaking of the assets of this country, gave the mineral resources first rank under the suggestive title, "the foundations of power." The higher the stage of civilization a nation may attain the more exact becomes this conception that mineral wealth is the foundation of power. It is not without striking significance that mineral names have been given to the steps in the evolution of society—the stone age, the copper age, the bronze age, the iron age, and finally the age of coal, in which we of this twentieth century live. And the dependence of society upon these mineral products is shown by the fact that never has the per capita consumption been greater, not only of coal, but also of iron and copper, and even of stone.

A nation that produces under normal conditions 40 per cent of the world's coal and 66 per cent of its petroleum, surely has its share of the two great fuels; add the fact that our mines, furnaces, and smelters yield 40 per cent of the world's iron, 60 per cent of its copper, and 32 per cent of its lead and zinc, and the reason is patent for America's industrial greatness.

OF STATEGIC VALUE

Independence through possession of the material resources essential to modern life is itself a promise of a nation's integrity, and the nation that makes the whole world its debtor through shipments of the mineral fuels and the metals and the mineral fertilizers, occupies a strategic position in the construction of international policy.

How best to realize upon this national asset is a problem in democratic government. Under Roman law and in part under early English law, as well as under most continental and Spanish-American systems, the ownership of mineral deposits was subject to certain rights of the sovereign. This "regalian right" had a common origin with the broader and more modern theory stated by General Halleck in 1860, that mines "are by nature public property and that they are to be used and regulated in such a way as to conduce most to the general interest of society."[2]

APPRAISAL OF MINES

This regalian doctrine has been followed by only a few of our States, and indeed it can be said that practically all that remains of this old doctrine in our present mining system is the common term "royalty," now used mostly, however, for the tax on output paid to the private owner. As a source of direct governmental revenue mineral deposits have been treated much as other property, on the principle that taxation shall be equal. In the recent discussion of this practical civic problem there stand out a few generalizations that perhaps present the difficulties of the problem rather than its solution. An equitable valuation of undeveloped ore deposits is hardly to be expected, and either a high valuation or a high rate of taxation must tend to hasten the exhaustion of a mine, resulting in overproduction and in the early termination of opportunity for the mine-worker. At best, both theory and method in the appraisal of mining property involve the determination of the present worth of expected profits. After estimating probable tonnage of ore developed and prospective, forecasting reasonable future costs, and averaging fluctuating prices, as well as giving due consideration to the rate of mining as possibly affected by market and other conditions, the public officer charged with making an ad valorem appraisal completes his task by applying a factor of safety as evidence of good faith.

ELEMENT OF COST

Opposed to this method of appraisal based upon expected future returns is the system of taxing the actual present output. Aside from the greater certainty of this method, the tax on output possesses an added advantage in that it provides revenue for local governmental purposes at the time when the demands are heaviest and in an amount roughly proportioned to those demands. However, either a tax or a royalty that is based upon the gross value of the output falls short of the ideal by its lack of consideration of the important element of cost, which may vary less than the unit value of the output, with the result that the tax rate which is excessive for a $5 ore is actually far less burdensome on $50 ore, although the amount of this tax is ten times as large.

More equitable than even a graded tax upon gross output is one assessed upon net returns. All that the public can logically ask on account of the development of mineral resources is a share in the profits. If in the operation of a mine the margin between costs and returns is small or nothing, why should society exact its pound of flesh? On the other hand, the regular dividend-paying company can well afford to recognize the general public as a silent partner possessing a share in the profits of the business. Professor Seligman believes that "the main reason why the twentieth century has become the century of income taxes rather than of property taxes,"[3] is the feeling on the part of business men that yield or income is the more satisfactory index of fiscal obligation.

BIG INDUSTRIAL FACTOR

It is as the basis of a nation's industrial growth, however, that mineral resources loom largest. Both self-centered independence and world-wide participation in commerce must come through the fullest use of these basal materials. Consumption of the essential minerals does not place a nation in the spendthrift class, but is in fact a measure of its industrial efficiency. It has been pointed out that the greater per capita consumption of coal in the United States than in any other country proves that this nation is burning coal for other nations—it is the gratifying test of industrial capacity. By this measure, too, Mr. Finlay[4] contends that "the industrial output per man is greater in the United States than in any other country.

The development of the United States in industries other than agriculture is well illustrated in the story of the utilization of our mineral resources. Though such argricultural products as cotton and the cereals continue to bulk large in the trans-Atlantic trade, the mineral products form a constantly increasing

(Continued on page 44)

---

[1] Lindley on Mines, I, p. 21.
[2] Quoted by Lindley, op. cit.
[3] Seligman, E. R. A., Am. Acad. Polit. and Social Sci. Annals, March, 1915, p. 5.
[4] Finlay, J. R., Min. and Met. Soc. America Bull., vol 8, p. 151, 1915.

WASHINGTON PRODUCES MORE COPPER AND LEAD

The value of the mine output of gold, silver, copper, lead, and zinc in Washington decreased from $809,767 in 1914 to approximately $728,000 in 1915, according to preliminary estimates by C. N. Gerry, of the United States Geological Survey. There were increases in copper and lead, to the extent of a return to normal production. There were shipments of zinc ore, the first since 1911. The gold and silver mines, however, showed decreased output, especially in the Republic mining district.

The mine production of gold, which is the most important metal of the State, decreased from $557,173 in 1914 to about $407,000 in 1915. The bulk of the gold came from ore shipped directly to smelters, as mills at Republic were idle. There were, however, gold mills operated in Chelan, Okanogan, and Whatcom counties. The Montana mine, in the Methow district, made a good production from a small mill, and the Molson, Poland China, and Duluth-Toroda mills were operated for a time.

SILVER OUTPUT DECREASES

The silver output of Washington mines decreased from 264,861 ounces in 1914 to about 220,000 ounces in 1915. This was also largely due to inactivity at Republic, where the mill bullion formerly produced contained considerable silver. Approximately 40 per cent of the silver came from the copper ores of Stevens County. A large portion had its source in silver ores shipped to various smelters from Republic.

The mine output of copper increased from 778,728 pounds in 1914 to about 915,000 pounds in 1915, or over 17 per cent. On account of the increased price of the metal, the value increased from $103,571 to about $159,000 in 1915. The production was not as great as the production of either 1913 or 1912. The greater part of the yield came from the Chewelah district, from which approximately 4,500 tons of crude ore and concentrates were shipped. Other low grade copper ores and iron ores containing some copper were shipped from Stevens and Ferry Counties.

The production of lead from ores sold or treated increased from 65,507 pounds in 1914 to about 230,000 pounds in 1915. The Bonanza mine at Bossburg was the main contributor. Small shipments were also made from the Nighthawk and Colville regions. Work was resumed at the Last Chance mine in the Northport district. The smelter at Northport was being remodeled to treat custom ore, but especially lead ore from Idaho.

ZINC FROM ONE DISTRICT

The zinc output was entirely from the Metaline district, Pend Oreille County, where the Lead-Zinc Company operated a 50-ton concentration mill the latter part of the year. Several hundred tons of sulphide concentrates were shipped, together with some carbonate ore. At the Oriole mine, in the same district, a similar mill was not operated.

At Chewelah in Stevens County the milling plant of the United Copper Company was being enlarged from twenty-four stamps with concentration tables, to fifty stamps with flotation machines. It is planned to work a large tonnage of tailings resulting from former mill operations. There was active development work in progress at other properties in the district on account of the price of copper, which reached nearly 20 cents per pound in June.

In the Republic district about 36,000 tons of crude ore, containing gold and silver, were shipped to smelters. In 1914 shipments consisted of 32,183 tons, but during that year ore was also milled. The important shippers were the Ben Hur, Knob Hill, San Poil, Surprise, Lone Pine, Pearl, Rathfon, Tom Thumb, and Trade Dollar. The Western Union Mines Company, which controlled the Surprise, Lone Pine, and Pearl properties in the early part of the year, failed and was followed by the West Virginia Mining Company, which also suffered financial difficulties. The San Poil mine and mill were in the hands of a receiver and fewer shipments were made. The North Washington mill was idle throughout the year. There was considerable activity at various properties in Okanogan County at Oroville and Nighthawk, and some shipments were made from the Sultan and Monte Cristo districts in Snohomish County.

In Demand by Schools

An increasing number of Survey publications are being used in school work throughout the country. Applications are being received almost daily from superintendents of schools and from officers of educational institutions who desire to make use of these publications in connection with studies along various lines.

> **"We think that the American Mining Congress deserves the general support of those engaged in mining. We need a parliament of mining operators and engineers to assemble periodically with a view to crystallizing opinion on matters of moment to the industry.**
>
> **"The social obligations of good citizenship call upon the members of the profession and the bigger brotherhood of all those actually engaged in mining operations to unite in giving effective support to the American Mining Congress."—Extracts from an editorial in The Mining and Scientific Press of September 18.**

THE
MINING CONGRESS
JOURNAL

PUBLISHED EACH MONTH BY
THE AMERICAN MINING CONGRESS.
Munsey Building. Washington, D. C.

Subscription Rate, per year............. $2.00
Single Copies.......................... .20

Entered as Second Class Matter January 30, 1915, at the Postoffice at Washington, D. C.

JANUARY, 1916

EDITORIALS

LAW FIFTEEN MONTHS OLD AND NO ALASKA LEASES

A committee of the House of Representatives of the United States, in order to take from the Alaskan coal claimant his last opportunity to protect his rights and defend his name and reputation, put this cunning section into the bill—(H. R., 14233, Sixty-third Congress, approved October 15, 1914): "Sec. 13. That the possession of any lessee of the land or coal deposits leased under this act for all purposes involving adverse claims to the leased property shall be deemed the possession of the United States, and for such purposes the lessee shall occupy the same relation to the property leased as if operated directly by the United States."

STILL LOCKED UP

This bill was enacted by Congress, and for fifteen months has been the law. No leases have yet been made, and the coal of Alaska, after thirty years of effort, is as effectually locked up today as at the beginning.

This Alaskan experience furnishes reasons why many citizens believe that the Government should dispose of all her public lands in limited areas to individual citizens at the earliest time possible, having due regard for other citizens who might desire to receive of the national bounty, excepting only such property as is needed for governmental purposes.

These argue that the direct management and supervision of mines and the agencies necessary to make governmental control effective will largely augment the functions of our Government and force it into comparative business competition with her own citizens.

THE OTHER SIDE

Many others, equally sincere, believe that the Government should retain ownership and control of those minerals which, being once exhausted, can never be reproduced and which are essential to our industrial progress. Just what the future control of the minerals on the public domain is to be probably will be decided by the present session of Congress.

This was one of the arguments presented by J. F. Callbreath, secretary of the American Mining Congress, in an address before the Pan-American Scientific Conference. He holds that this controversy is one of the most important internal questions ever presented for consideration to the people of the United States.

GOVERNMENT LEASING PROVED FAILURE ONCE

The policy of the Federal leasing of mineral lands was in effect a little more than forty years. The operation of this system did not bring about any substantial development of mineral resources, did not bring to the Government any substantial income, and did create much discord.

In accordance with President Polk's recommendations, the Acts of July, 1846, and March, 1847, made a radical change in the disposition of mineral lands on the public domain, abolishing leases and substituting cash sales therefor. By the Act of 1849 the charge of mineral lands was transferred from the War Department to the Department of the Interior.

The more liberal policy of dealing with public lands soon manifested its advantage. As early as the year 1854 the Commissioner of the General Land Office gave expression to the following language: "It is impossible to portray the benefits already derived by the West from this system. Immense regions have been disposed of that were thought to be wholly unsalable because of the difficulty of access. The Government has consequently been benefited." Reference was made to the fact that the Government had already received $146,195,641 for the sale of land in the South Atlantic territory, "the benefits of which go chiefly, if not entirely, to the people of the old States. This amount, it will be remembered, is exclusive of the sum of more than $48,250,000 net receipts for imports at the ports of Florida and Louisiana, which went in the Treasury, and by which the people of the old States were also proportionately benefited." Thus it will be perceived that mutual benefits to an immense extent and in about equal proportion have flowed to both the old and new States under this judicious system, and if either has apparently the advantage it is all in one great family and not a sufficient ground of controversy between fathers and sons. "The true policy of the land system is, first, to encourage the actual settlement and improvement of the public domain."

LACK OF COOPERATION CAUSE OF SERIOUS LOSS

A gratifying number of accessions to the American Mining Congress has resulted since the last annual meeting. There is reason to believe that new members will continue to enter at an increasing rate. A campaign for increased memship is under way and will gain in effectiveness as it progresses.

Never before in the history of the world has the value of cooperation been so well understood. Germany's accomplishments during the past year and a half have demonstrated the value of team work more than ever before has been the case.

Humiliating as it is to acknowledge, most of the woes of those who own or operate mines are due to their lack of cooperation. Hundreds of opportunities have been lost for the same reason.

Had there been proper team work in the mining industry millions of dollars would have been devoted before now to research work by the government that in the absence of cooperation have remained unappropriated. Had equitable sums been available through the years there is no telling how much further advanced the industry might be.

That those directing the mining operations of the country have not been attentive to appeals for organized effort is indecated, in one instance, by the fact that of 90,000 active mining men in the United States less than 1,600 have affiliated themselves with the American Mining Congress.

INGALLS, SAUNDERS, SCHOLZ SHARPLESS AND WINCHELL

Prsidents of the greatest three organizations within the mining industry stood before an audience of mine operators, legislators, and experts of the Geological Survey, the Bureau of Mines and the General Land Office last month and pleaded for consideration at the hands of Congress. It was the occasion of the meeting called by the Mining and Metallurgical Society. The presidents referred to are W. R. Ingalls, of the Mining and Metallurgical Society of America; W. L. Saunders, of the American Institute of Mining Engineers and Carl Scholz of the American Mining Congress.

The sessions, which were held in the auditorium of the National Museum, through the kindness of the officials of the Smithsonian Institution, were very impressive. They started in motion influences that will not expend their energy for years to come.

F. F. Sharpless, the secretary of the Mining and Metallurgical Society, looked after the preparation for the meeting with such thoroughness that there was not a single hitch in carrying out the program.

Special mention is due Horace V. Winchell, chairman of the committee on resolutions. Mr. Winchell combines a remarkable store of energy, with a degree of personal magnetism and a keen intelligence, that make him a great asset to the mining industry.

WHOLE STRENTH OF MINING INDUSTRY TO BE MARSHALLED

A distinguished company of mining men assembled in Washington last month and discussed the means of securing urgently needed revision of mining laws. These men were made to realize, we believe, the necessity of marshalling the full strength of the industry if any legislation is to be secured.

It was brought out very plainly that there is no chance of getting bills through Congress without concentrating great pressure upon them. Sad as it is that a great industry such as is mining has to maneuver and campaign to get consideration at the hands of the nation's lawmakers, yet it is only too true that it is necessary. Theoretically it is all wrong but the condition exists and it must be met.

Some of the biggest men in industry, as a result of the recent meeting, probably realize now as never before the necessity of cooperating in an effort to see that mining gets its just deserts: Not only is mining discriminated against but it is forced to continue to wear clothing of the same size as was fitted to it in 1872. The industry has outgrown this clothing, which has become a straight jacket. It is going to take a lot of hard work to get rid of the laws of 1872 but we believe that at last there will be sufficient concert of action directed to this end by the mining men of the country to accomplish it. There is little doubt of the passage of the bill of Senator Smoot providing a commission for the investigation which is to precede the revision of the mining laws. Whether the Taylor bill can get through the House is the question. Mr. Taylor can be relied upon to do his part. If the mining industry will hold up Mr. Taylor's hands his task will be brought within the possibility of accomplishment.

The gathering here of leaders in the industry has had the effect of calling particular attention to the value of maintaining with impressive support such an organization as the American Mining Congress. The American Mining Congress should have the support of every association of mining men in the country and of every individual operator who is not affiliated with such an association.

Legislators are impressed with the needs of agriculture because its numerical strength in practically every Congressional district in the United States is very evident. Mining is unfortunate in being confined to restricted areas generally far removed from centers of population. The needs of the industry are not brought to the attention of the great majority of Senators and Representatives through actual contact with the industry or its people. Therefore it is so necessary to have an organization, representing as nearly the whole industry as possible, to do missionary work among those whose attention must be called specifically and repeatedly to the needs of mining.

TWO IMPORTANT POINTS IN AMERICAN HISTORY

The growth of the United States as a world power began at Sutter's Creek in 1848—a growth so rapid as to astonish the world. During the dark days of the Civil War the gold of California and the silver of Nevada saved the nation's credit and played an important part in the preservation of the Union.

No opportunity should be lost in impressing these two important facts on the public.

Recent Legal Decisions

GRUBSTAKE CONTRACT

An agreement stipulated that one of the parties is and shall be a full-fledged partner with the three other persons named, and have one-quarter undivided interest in all claims, lodes and water rights acquired or to be acquired and owned by the above-mentioned parties, the agreement stating that the one person so made a partner is to furnish the above-mentioned parties with provisions from time to time up to a stated date. The consideration for the transaction was $30,000 and the agreement provided for the payment of $6,000 cash, the balance of $24,000 to be paid "of the first money taken out of the ground." In the controversy over the mining operations and an action to dissolve the partnership the words "of the first money taken out of the ground" were held to mean the first money taken out of the ground to which the grantee was entitled, which would be one-fourth of the amount so taken, or the gross amount to which the grantee would be entitled and not the net proceeds, and where it appeared that the aggregate gross amount was $26,038.30, the grantee is entitled to have one-fourth thereof, or $6,509.57, applied to the $24,000 deferred payment. But as the business of the firm resulted in a deficit the adjustment had to be apportioned in the payment of the indebtedness of the firm, and where it appeared that the total indebtedness was $19,314.94 the original grantee was held liable to the amount of $10,628.76.

Lesamis *vs.* Greenberg, 225 Fed. 449, p. 450 (August, 1915).

BANKRUPTCY—INSOLVENCY

Payments made by an insolvent mining corporation that amount to a preference constitute such acts of bankruptcy as will cause the corporation to be adjudged a bankrupt, where the corporation had reasonable cause to believe that the payments would effect a preference and such preferences are available.

Wise Coal Co. *vs.* Small, 225 Fed. 524, p. 525.

RIGHTS OF PARTNERS

On the sale of assets of a partnership the partners will share equally in the proceeds and be entitled to have the same applied in that proportion to their indebtedness to the firm and the adjustment in the end must be on the basis of an equal division of the partnership property; and mining claims held by three persons at the time of making an agreement with a fourth by which he should become a partner with a one-fourth undivided interest in all the mining properties then owned or to be acquired, and pursuant to which agreement the three persons conveyed to the fourth the undivided one-fourth interest in the mining property, which constitutes such claims partnership property and they are subject to the partnership indebtedness as partnership assets.

Lesamis *vs.* Greenberg, 225 Fed. 449, p. 452.

CORPORATION TAX

Section 5506 of the General Code of Ohio refers to fees, taxes and penalities required to be paid only by corporations doing business and does not intend that a receiver shall pay such fees, taxes and penalties, as the penalties are required to be paid only by corporations doing business, and the purpose of the statute is to fix a lien for the payment of the tax by the corporation required to pay it, upon the property employed in the transaction of its business or in the hands of a receiver, or if the property is gone into the custody of a court of equity through its receiver, and the recovery must recognize the lien of the statutes upon the assets in his hands for the tax of a preceding year, imposed upon the corporation when it was doing business, but this section of the statute does not impose a tax when the reason for the tax and its only justification no longer exists. This construction of this section reconciles it with the other sections of the statute on the same subject, which the court is bound to effect if possible, and brings about a result not only equitable, reasonable and just, but also in consonance with the clear intention of the legislature to impose a tax upon the right granted by the State to be a corporation and to continue to do business as such.

Keeney *vs.* Dominion Coal Co., 225 Fed. 625, p. 627.

PROPERTY IN HANDS OF RECEIVER

The assets of a corporation in the hands of a receiver do not belong to the corporation, but to the creditors, and the court holds such assets for distribution to creditors as their respective interests may appear, under the rule that when a corporation becomes insolvent it is so far civilly dead that its property may be administered as a trust fund for the benefit of its stockholders and creditors.

Keeney *vs.* Dominion Coal Co., 225 Fed. 625, p. 628.

FRANCHISE TAX

Under the constitution of Ohio the power of taxation of privileges and franchises is limited to the reasonable value of the privilege or franchise conferred originally or to its continued value from year to year; and these limitations prevent confiscation and oppression under the guise of taxation, and the power of such taxation cannot extend beyond what is for the common or public welfare and the equal protection and benefit of the people, and where the property of a corporation has passed into the hands of a receiver and the corporation ceased to do business, the franchise of such a corporation to be a corporation and to conduct its authorized business as such is of no value to the receiver and to the creditors whose property he holds and whom he represents, and the franchise tax imposed by the statutes of Ohio on such a receiver is, in its operation, confiscatory and oppressive, and to that extent unconstitutional.

Keeney *vs.* Dominion Coal Co., 225 Fed. 625, p. 628.

FAILURE TO DECLARE DISSOLUTION

By Section 5509 of the General Code of Ohio it is the mandatory duty of the Secretary of State to cancel the articles of incorporation of a corporation that fails or neglects to make report or to pay its franchise tax for ninety days after the statutory time and thereupon its franchise would come to an end and the tax could not subsequently be imposed. And where a corporation becomes insolvent and passes into the hands of a receiver, the mere fact that the corporate officers did not begin proceedings for a dissolution does not enable the State to impose the franchise tax, where if the Secretary of State had done his duty under the mandatory act the corporation would have been dissolved.

Keeney *vs.* Dominion Coal Co., 225 Fed. 625, p. 629.

CONTRACT OF SALE

In an action by a purchaser of a mine to recover money paid by the purchaser to the seller upon a contract for the sale and purchase of the mine, where the plaintiff alleges that he was induced to agree to make the purchase by false and fraudulent representations made to him by the seller, to the effect that there was a certain vein in the mine at a certain place or level, and where the plaintiff had fully rescinded the contract before the commencement of the action, the defendant is not entitled to introduce evidence to prove the value of the mine, where there is no claim on the part of the defendant and no allegation in the plaintiff's complaint, that the defendant either represented or misrepresented the value of the mine as a whole at the time the situation is constantly changing.

Cohen *vs.* Stockton (California), 151 Pac. 741, p. 742 (August, 1915).

DUTY TO FURNISH SAFE PLACE

The rule requiring a mine operator to furnish the miner a safe place in which to work does not generally apply when the miner himself is engaged in making the place and when the situation is constantly changing.

Calumet Fuel Co. *vs.* Rossi (Colorado), 151 Pac. 935, p. 936 (October, 1915).

MINER'S KNOWLEDGE OF CUSTOM

In the absence of a positive rule of law imposing upon a mine operator the safe-guarding of an entry or a travelingway through a miner's room there is no reason why a general custom, known to the miner, under which miners assume the duty of keeping safe the rooms and the ways, is not binding upon the miner; and in an action by a miner injured by a fall of rock from the roof the mine operator is entitled to have his case presented to the jury on his theory and he has the right to have the jury pass upon the matter of the custom and the miner's knowledge of it; and instructions by the court to the jury which prevented the mine operator from having his case thus presented were erroneous and sufficient to cause a reversal of the case.

Calumet Fuel Co. *vs.* Rossi (Colorado), 151 Pac. 935, p. 936 (October, 1915).

EFFECT OF SURRENDER CLAUSE

A surrender clause in an oil and gas lease which gives to the lessee the right at any time to surrender and terminate the lease, after which all payments or liabilities should cease and terminate, deprives the lessee of the right of specific performance, directly or indirectly, until he has performed the contract or placed himself in such a position that he might be compelled to perform it on his part.

Hill Oil & Gas Co. *vs.* White (Oklahoma), 151 Pac. 1051, p. 1052 (October, 1915).

AGREEMENT TO EXECUTE

An agreement between two persons providing that when the first contracting party acquired title to certain land on which he had filed, he would for the consideration specified execute to the other party an oil and gas lease. In an action for such contract where under the agreement the lease was to run for fifteen years, or as long thereafter as either oil or gas should be produced, and where the agreement provided that in case operations were not commenced in fifteen years the lessee was to pay an indefinite sum for each additional year, the commencement of operations was delayed, thereby leaving it entirely to the option of the lessee to either drill or not to drill for oil or gas, and under the rule that contracts unperformed which are optional as to one of the parties, are optional as to both, a court will not order the specific performance of the agreement to execute the lease, on the ground that the lease contract sought to be enforced presents terms which preclude its favorable consideration at the hands of a court of equity.

Hill Oil & Gas Co. *vs.* White (Oklahoma), 151 Pac. 1051, p. 1052 (October, 1915).

OIL AND GAS LEASE

Specific performance of an agreement to execute an oil and gas lease will not lie unless the agreement is certain and fair, and just in all its parts; and in an action to enforce specific performance of such a contract to execute an oil and gas lease, any element showing the contract unfair or unjust and against good conscience, will justify the court in refusing a decree of specific performance, although the lease, had it been executed, might offer no sufficient grounds for cancellation.

Hill Oil & Gas Co. *vs.* White (Oklahoma), 151 Pac. 1051, p. 1052 (October, 1915).

GRANT OF OIL AND GAS

Oil and gas while in the earth, unlike solid minerals, are not the subject of ownership distinct from the soil, and a grant of the oil and gas is a grant, not of the oil that is in the ground, but of such a part as the grantee may find, and passes nothing that can be the subject of ejectment or other real action.

Hill Oil & Gas Co. *vs.* White (Oklahoma), 151 Pac. 1051, p. 1053 (October, 1915).

BANKRUPTCY PROCEEDINGS

In proceedings of creditors to have a mining corporation declared a bankrupt on the ground of the alleged indebtedness of the corporation to the petitioners, the stockholders of the corporation may intervene if the directors fraudulently fail and refuse to oppose the petition or interpose any defense, and where the petition to intervene shows that the directors are adversely interested and are permitting the property to be sold so that they might acquire it at less than its value; and in such case the stockholders are not required to take the ordinary preliminary steps before bringing suit.

Ogden *vs.* Gilt Edge Consolidated Mines, 225 Fed. 723, p. 728.

CUSTOM AS TO PROPPING ROOF

Under the Kentucky statute of 1913 and before the amendments of 1914 it was the duty of a mine owner, after a miner had selected and marked them, to furnish to the miner a sufficient number of caps and props to be used by him in securing the roof in his room, and at such other working places where by law or custom of those usually engaged in such employment it was the duty of the miners to keep the roof propped; but this statute does not apply where, by custom or rule of the mine, the duty of propping or timbering does not devolve upon the miner himself, and where an injured miner in an action for damages shows that under the custom of the mine no duty of propping devolved upon him.

Carter Coal Co. *vs.* Hill (Kentucky), 179 Southwestern 2, p. 4 (October, 1915).

RISKS NOT ASSUMED

Section 28 of the Tennessee act of 1903 requires that the bucket shall be covered and there shall be certain structures inside of the shaft to make safe the ascent and descent of the miner, and this act applies to a mine incomplete, but where a shaft had been sunk to a depth of more than 250 feet, from the foot of which a drift was run to the location of an old shaft on the property with a view to drilling upwards and reaching the bottom of such old shaft and thus connecting the two, and where men were taken up and down the new shaft for the purpose of working in the incompleted mine, and in such addition and in so using the shaft there was as much need to the miners of the protection required by the statute as there could be when the mine was completed and in active operation. The miners in thus using the shaft and in being lowered and raised in the bucket did not assume the risk of the operator's failure to comply with the statute, for the reason that to hold that miners did assume the risk would be equivalent of a repeal of the statute, as this would be a continuing invitation for the operator to forbear compliance with the statutory provision and the very purpose of the statute was to protect those who were unable to protect themselves, occupying as the miners necessarily do a position much inferior in financial security to that of the mine operator.

American Zinc Co. *vs.* Graham (Tennessee), 179 Southwestern 138, p. 139 (October, 1915).

MISTAKE OF LAW

A coal lessee accepting a lease to mine coal and pay a certain stipulated royalty per ton for all the merchantable coal mined and removed and a fixed minimum cash rental of a certain stated amount per annum during the continuance of the lease, cannot refuse to pay the stipulated royalty on the ground of a mistake in reliance upon the lessor's ownership of one of the four tracts and that by reason thereof more coal had been paid for than was under the other three tracts, where all the facts concerning the disputed title were of record when the lease was made and the mistake, if there was a mistake, was a mistake of law and not of fact.

Clark *vs.* Lehigh & Wilkes-Barre Coal Co. (Pennsylvania), 95 Atlantic 462 (July, 1915).

DANGEROUS CONDITIONS

The mining act of 1891 of Pennsylvania does not relieve the mine operator from liability for his own neglect or failure of duty; and if through any neglect or failure of duty he causes injury to one of his employes the general rule applicable in such cases subjects the owner to damages for such default, and if there is a dangerous condition existing in the mine which is permitted by the negligence of a mine foreman, resulting in injury to an employe, the mine owner will be responsible if he has knowledge of the fact and takes no step to remove it, as the owner cannot neglect his duty and escape liability, and the statute expressly provides that the owner shall use every precaution to insure the safety of the workmen in all cases whether provided for in the act or not.

McCollom *vs.* Pennsylvania Coal Co. (Pennsylvania), 95 Atlantic 380, p. 391 (May, 1915).

LIABILITY FOR NEGLIGENCE

Rule 44 of the act of 1891 of Pennsylvania requires an efficient alarm to be provided and attached to the front end of every train of cars operated by locomotive in any mine or part of a mine; and this applies not only to the main roadway of the mine but extends to every siding in every heading of the mine, and the duty to provide the alarm is one which in its very nature devolves upon the mine owner in so far as providing the alarm is concerned, and the future or the negligence of a mine foreman to perform this duty, if known to the operator, or if it had continued for so long a period that it should have been known to the operator or owner, will render him liable for injuries resulting from either his own or the foreman's negligence in this respect.

McCollom *vs.* Pennsylvania Coal Co. (Pennsylvania), 95 Atlantic 380, p. 381 (May, 1915).

SPACE AT SIDE OF TRACKWAY

Section 8582, Burns' Statutes of Indiana, makes it unlawful for an owner or operator of a coal mine to construct an entry or trackway in a coal mine without a space of at least 2 feet on one or both sides so that drivers may get away from the car and track in event of collision, wreck or accident, and the term entry or trackway applies to a place where a track is laid rather than to the track itself and was intended to give sufficient room to provide a safe place for the car drivers in case of an accident, and the failure of an operator or owner to furnish such space may be the proximate cause of an injury to a driver injured after an accident produced by other causes, where he is unable to escape by reason of the operator's non-compliance.

Elder *vs.* Erie Canal Coal Co. (Indiana Appellate), 109 Northeastern 805, p. 806 (October, 1915).

VIOLATION OF STATUTORY DUTY

The purpose of the Virginia statute of 1912, known as the Mining Act, was to promote the safety of miners and was intended to relieve employes or miners in mining operations from exercising that degree of care and diligence for their own safety which the law required prior to the enactment, as it expressly provides that it shall be the duty of each miner to properly prop and secure his place in order to make the same secure for him to work therein and prohibits a miner from working unless he has props and timbers sufficient to make the place secure and if a miner's place becomes dangerous and is known so to him he is guilty of contributory negligence in not leaving his working place until sufficient props arrive to make the place secure, and the statute imposes the duty on him to leave his working place as soon as it becomes insecure from lack of props as well as upon the operator to furnish props, and the violation of this statutory duty by a miner will preclude a recovery either for an injury or death.

Virginia Iron, Coal & Coke Co. *vs.* Asbury (Virginia), 86 Southeastern 148, p. 149 (September, 1915.

ENRIQUE CUEVAS

Whose paper on nitrates at the Pan American Scientific Conference excited much discussion

No Cadmium Ore Produced

Cadmium in this country has been recovered in smelting zinc ores or in smelting lead ores. No known ores in the United States contain enough cadmium to be called cadmium ores.

(Continued from page 4)

Abstracts of some of the papers read before the conference follow:

EMPLOY 6,000,000 MEN

Mines of World Give Occupation to Myriad of Workers—Fay Gives Figures

The magnitude of the mining industry may be grasped when one realizes that more than 6,000,000 men are engaged in the mines of the world, says Albert H. Fay, a mining engineer of the Bureau of Mines in a paper read before the Pan-American Scientific Conference. Of this number 3,800,000 are employed in the coal mines, and 2,200,000 in the metal mines. In addition, millions more are engaged in allied industries dependent directly upon the mines for coal and metal.

Mining is one of the hazardous industries, in which three out of every 1,000 men employed are killed each year by reason of some accident. While world-wide data relating to non-fatal injuries are not available, yet reports for all metal mines in the United States, over a four-year period, show that thirty men per 1,000 are injured sufficiently to cause a loss of time of twenty days or more, and 150 per 1,000 receive minor injuries resulting in a loss of time of one to twenty days. A reduction of 50 per cent in the number of accidents would mean a saving of 9,000 lives every year, in addition to reducing the loss of time and suffering resulting from non-fatal injuries.

The principal causes of accidents are as follows: Falls of roof represent about 48 per cent of the fatalities in coal mines and 35 per cent in metal mines; explosives, 11 to 15 per cent in metal mines and 5 per cent in coal mines; haulage systems, 15 to 20 per cent in both coal and metal mines; electricity, 4 per cent; and mine fires, gas and dust explosions in coal mines, from 12 to 15 per cent.

In order that accident records of one country may be comparable with another, they should be collected and tabulated on a uniform basis, being careful to separate each branch of the industry from all others. The number of men employed should be clasisfied as underground and surface employes, with a corresponding grouping of fatal and non-fatal injuries by principal causes.

Accident rates are usually calculated on the number or men employed, the tonnage of coal produced, or a percentage basis, none of which is as correct as when computed on a man-hour basis of 2,000 or 3,000 working hours per year. The latter takes into consideration the actual length of time that the men are exposed to the mining risk, while the other methods of rating do not.

In all industries there are a certain number of accidents that are inherent, for which it is impossible to place he blame on any one. These equal about 50 per cent in the mining industry. The responsibility for the remainder may be placed about equally on the operator and the employe, as shown by the records of the inspectors of the Union of South Africa.

Accidents may be reduced by more stringent laws concerning the operation of mines, with penalties for all violations, whether operator or employe. The education of the miner to realize the dangers under which he works will have much to do with accident prevention. A common language, understood by both foreman and miner, is of prime importance. Improved safety appliances will lessen the dangers incident to the industry. The cooperation of State and Federal organizations with operators' associations, labor organizations, operators and employes; and, last but not least, eternal vigilance on the part of all, will minimize the mine-accident hazard.

Radium and Associated Metals

By C. L. Parsons.

The chief ores from which radium is made are pitchblende, occuring in Austria and Colorado; carnotite, occurring in Colorado, Utah, and Australia; and autunite, occuring in Portugal and Australia.

Radium is extracted from these ores by fusion methods or by leaching by acids. The methods for extracting redium from pitchblende are well known. The method devised by the Bureau of Minles for extracting radium, uranium, and vanadium from carnotite is entirely new; the cost of extraction is much less than the method heretofore used, and the efficiency of extraction is higher. This method consists essentially in heating the ore in stoneware extraction vessels with hot concentrated nitric acid. The use of strong hot nitric acid is especially essenital, owing to the fact that it has a high solubility coefficient for radium-bearing sulphate, and accordingly dissolves any such sulphates as may be present in the ore. This would not be the case if dilute acids were used. The strong nitric acid solution is diluted and nearly neutralized with sodium hydroxide, barium chloride added, and radium and barium precipitated by means of sulphuric acid. From the filtrate the uranium and vanadium are recovered as sodium uranate and iron vanadate. The radium-barium-sulphate is reduced by charcoal, dissolved in hydrochloric acid, and the radium crystallized from the barium, first in the form of chlorides and finally as bromides. By this method over 90 per cent of the radium present can be recovered from carnotite. The cost of extraction, including the cost of ore, 20 per cent amortization of plant, research costs, insurance, repairs, etc., has been $37,599 per gram for the first 4 grams obtained.

Geological Surveys

By David White

This paper is designed mainly for the information of persons interested in the work of a geological survey or in the establishment of a publicly organized survey. It discusses the objects of such an organization, the principles which should be safeguarded in order to make it of greatest benefit to the public, and the costs of the geological investigations in particular. Educational and research work are urged as inherent duties of a governmental scientific institution. The recommendations of principles are largely founded upon the experiences of the United States Geological Survey. The cost data, based upon the records of that survey and two prominent State surveys, relate, for the most part, to the costs for field investigations and office preparation of reports, comprising the purely geological part of the work, and are expressed in dollars per square mile of detailed work on the 1:62,500 scale in different geological provinces, embracing varied field conditions, types of structure, and mineral deposits.

Iron Ores of the Americas

By C. K. Leith

The distribution of the present production of iron ores by kinds is summarized with the aid of table and charts. The distribution of the reserves is summarized by table and charts. A comparison is made of the distribution of the present production and the distribution of reserves, bringing out the fact that there are large reserves of ore in the two Americas which are not now being drawn upon.

A summary is made of the factors which determine why certain ores are used and others are not used. All these factors are summarized under the general term "availability." The point is made that the availability (and therefore value) is determined only in part by the intrinsic qualities of the ore and large by the effort and money spent on the ore. That any intelligent formulation of laws of governmental control of ore reserves in the way of taxes or other measures requires careful consideration of this point in order that opportunity may be left open for the application of the human factors which so largely determine the availability and value of an ore body.

Because of the great variety of factors entering into the problem, it is difficult to forecast the distribution of future production of iron ores, but certain recent tendencies are enumerated which seem to present certain changes for the future.

Braden Copper Company

By B. T. Colley and R. E. Douglas

The mines of the Braden Copper Co. have been known for 100 years, more or less, and were worked by many owners during that time. The ore is a shattered andesite forming the circumference of an extinct volcano.

In 1904 Mr. Barton Sewell and Mr. Wm. Braden and their friends formed the first Braden Copper Co. They built a small mill and later a small smelter, and extracted metal by means of crusher, jigs, tables, and buddles, and smelted the concentrate to matte in blast furnaces. The property was taken over by the present holding company in 1908.

A railroad and a hydro-electric plant were immediately started and rushed to completion. It was planned to extract the metal by crushing and then by Woodbury jigs, Wilfley tables, and Frue vanners. The resulting concentrate was to be treated in one of two ways: either by roasting, leaching with acid fabricated from the roaster gases and precipitating the copper from the solution by electrolysis, or by direct smelting. Both methods were thoroughly tested. Subsequent enlargements of the plant made necessary by further increase in the ore body precluded leaching because of lack of power.

The concentrating plant passed through a long period of experimentation to its present flow sheet, which is as follows:

Gyratories, rolls, Symons crushers, rolls, Marcy mills, Wilfley tables, Hardinge mills, oil flotation, seconded by air cells and partial filtration of the concentrate.

The smelter, having adopted the blast furnace instead of the reverberatories, chiefly because the cheap electricity rendered impossible the utilization of the waste heat power, passed through briquetting, pugging and sintering to nodulizing. The plant will now dry the concentrate with waste heat from nodulizer, and then nodulize. The nodulizer product will be smelted in blast furnaces and the resulting matte converted to blister copper. Later an electrolytic refinery may be added.

Export Coal Considerations

By G. S. Rice

In the United States except in the anthracite district of Pennsylvania, coal mining conditions are generally more favorable than in Europe. The mines are comparatively shallow, the coal beds are level or little folded, beds less than 2½ feet thick are seldom worked, except in the anthracite mines less fire damp is encountered, and less dead work is required.

The average value of coal in the United States on cars at the mine in 1913 is reported as $1.18 per short ton ($1.30 metric) for bituminous coal and $2.13 per short ton ($2.35 per metric and $2.39 per long ton) for anthracite. In Wales in 1913 the average value per long ton at the mine for all kinds was $2.86, and in Great Britain as a whole $2.48 ($2.44 metric). In the German empire the average value for all kinds of coal f.o.b. cars at the mine, in 1913 was $2.50 per metric ton, and for Westphalian coal $2.61.

Net mining profits in Great Britain and Germany are between 25 and 50 cents per ton, as compared with probably not more than 5 cents for bituminous coal in the United States. Evidently, in the United States costs at the mine on export coal cannot be much reduced, but railroads may perhaps be able to lower their tariffs for such coal.

Because of low mining costs, the on-ship price of United States bituminous coal is less than that of corresponding British and German coals at their home ports. In 1913 the average declared value of all classes of British coal exported was $3.40 per long ton ($3.33 metric) and the price of best Welsh steam coals, f. o. b. Cardiff, ranged from $4.50 to $5.10 per ton ($4.40 to $5 metric). Westphalian steam lump coal, f. o. b. Hamburg, ranges from $4 to $5 per metric ton.

Compared with sailing distances from British coal ports, those from the chief United States export ports are 460 miles less to Atlantic ports of South America, and via the Panama Canal 2,560 miles nearer to Pacific ports. Compared with German ports, distances are 767 miles less to Atlantic coast ports and 2,867 miles less to Pacific coast ports via the Panama Canal.

Yet in spite of higher prices at shipping ports and longer distances, coal exports to South America are chiefly from Great Britain.

Tin Ores in Bolivia

By Scoville E. Hollister

Present tin-milling methods, except in the case of a very few companies, are little different from those practiced years ago. This condition is gradually changing, and the tendency is toward better methods and greater savings. The principal ore is the oxide, cassiterite. Mining is yet in the high-grade stage, the mills in most cases treating 10 per cent ore. In the past a large part of the production has been from very high-grade shipping ore. This has been the salvation of some of the present large companies, counterbalancing the wasteful operations in their other departments. With the exhaustion of the present high-grade deposits, plants must be equipped to treat low-grade ore, of which there are large reserves.

The plants are nearly all equipped to treat oxidized ores, those found first in mining operations in this country. With the pyritic ores, encountered at depth, the milling becomes more complicated and requires different machinery. Several companies are now using automatic-roaster, magnetic-separator plants for the separation of the cassiterite and pyrite. This is proving satisfactory.

Arsenopyrite causes trouble because of penalties imposed by the smelters for arsenic, but this is kept within the contract limits by mixing with clean concentrates or by roasting.

Except in the district of Potosi, no tin is smeltered in Bolivia. There a little low-grade concentrate is treated, a tin of about 95 per cent purity resulting.

Placer mining, except in small operations, is not practiced. The various districts have been prospected and several reported upon favorably, but no further action has as yet been taken.

Labor is cheap, but not efficient. Holidays are numerous. This, in combination with expensive supplies, materials and transportation, makes mining and milling in Bolivia difficult. However, conditions are becoming better, and with the United States wanting tin to smelt, business relations between the two countries should improve.

Mining in Ecuador

By J. W. Mercer

The author gives a full description of the country, including industries, agricultural products and means of transportation.

Owing mainly to scarcity of means of transportation, the mineral resources of Ecuador have hardly been investigated. At present there is but one mining enterprise in actual operation—the Zaruma gold mines in the south. Iron, lead, zinc and copper ores have not been found in workable quantities. Oil has been discovered in some places, mainly along the Pacific coast, near Guayaquil. In 1913 the production was at the rate of from 10,000 to 20,000 barrels a year.

Coal—a low grade of lignite—has been found in some places, but the seams have not been worked. Mercury has also been found. but not developed. As to silver, some attempts have been made to work a few mines, but without success.

Practically gold is the only metal produced. The sand and gravel of nearly all rivers contain this metal, which the Indians separate by washing. Systematic placer mining has been unsuccessfully attempted.

The Zamura gold mines are about 150 miles south of Guayaquil. The altitude varies from 2,000 to 5,000 feet above sea level. The country rock is andesitic, and is cut by numerous faults. The veins are mainly of quartz, and in the neighborhood of the fault often contain large quantities of calcite. The sulphide minerals (pyrite, chalcopyrite, blende and gelena) also occur. The ore as milled is a mixture of quartz and calcite, with perhaps 10 per cent of sulphides. It is treated by first crushing, then regrinding in tube mills, followed by agitation in cyanide solution. Water power from several large rivers near the mines is utilized. There is no railroad connection, and all freight is transported by mules. At present the mines employ 500 Ecuadorians and 40 foreighners. The natives are good workers, and get about 50 cents (American) a day. Miners, whose pay is based on meterage of hole drilled, make between $1 and $3 a day.

Value of Technical Societies

By Rossiter W. Raymond

The secret of the rapidity of modern technical progress is the rapid and abundant interchange of ideas. Knowledge in itself is not power. It is simply weight or force. Knowledge in motion is power; and the formula Mv^2 applies to spirit as well as to matter.

Technical societies promote the acceleration of progress: (1) by bringing workers and students together; (2) by persuading them of the advantage of publicly exchanging, rather than jealously hiding, their discoveries and experiences; (3) by training them in the art of clear and conclusive statement; (4) by providing the means of accurate publication, appropriate circulation and permanent preservation of the important records and results of practice and discussion; (5) by making professional ability known to a wide circle of experts, and thus facilitating personal promotion and success; (6) by assisting in research through the use of their libraries and files of exchanges, not only by those who can personally consult such sources of information, but also by those who are too far away to do this directly, but can enjoy its benefit through the assistance of competent experts provided by the societies, and, finally (7), by lessening the loss to science and art caused by the death of experts who carry to the grave their acquired knowledge and wisdom and leave no man the better for it all.

These different functions of technical societies are discussed in the paper at some length. Under the head of publications, especially, the proper sphere and nature of the publications of a technical society as distinguished from newspaper articles, contributions to technical magazines, graduates' theses, and formal treatises, text-books, and encyclopædias is explained, and the special usefulness of competent editorial revision is emphasized.

On the basis of this general description, it is suggested that membership in a great technical society ought not to be limited by unnecessary conditions. Moreover, since the first step is to get men together, and the next to keep them together, it may well be understood at the beginning that the united influence of such a society is not to be used for any propaganda whatever. The society should be a free forum for the discussion of all pertinent subjects, and not a tribunal for pronouncing judgment.

This point is argued at some length, and it is shown how attempts to utilize such a society for the benefit of some cause outside of its prime purpose reacts against that purpose itself.

In short, the author maintains that many benefits which might well be sought by special guilds or unions should not be sought through a technical society such as he has in mind, and defines by quoting from the charter of the American Institute of Mining Engineers the statement of the object of that society as:

"Promoting the arts and sciences connected with the economic production of the useful minerals and metals and the welfare of those employed in these industries by means of meetings for social intercourse and the reading and discussion of professional papers and to circulate by means of publications among its members and associates the information thus obtained."

SOUTH DAKOTA HAS PRODUCED NEARLY $200,000,000 IN GOLD

The mine production of gold from South Dakota in 1915 was $7,390,000, compared with $7,333,508 in 1914, and that of silver was 193,000 ounces, compared with 176,642 ounces in 1914. A nominal quantity of lead was produced. These are preliminary estimates reported by Charles W. Henderson, of the United States Geological Survey. Since 1876 South Dakota has produced $192,677,000 in gold, and 6,026,000 ounces of silver.

The Homestake mine and amalgamation-cyanidation mills were operated continuously throughout the year, with an increased output.

The Golden Reward cyanidation mill was operated steadily on siliceous ore from its mines, and during the later part of the year an additional product was sent to the mill in the form of roasted sulphide or "blue" ore. These sulphide ores had never before been treated successfully by cyanidation. Results indicate 90 per cent extraction as compared with 35 per cent without roasting. Sulphide ore of sufficient grade is sent to smelters.

The Mogul cyanidation mill was operated steadily on company and custom ore, with an increase in capacity. The Reliance cyanidation mill was also operated steadily on company and custom ore. The Trojan mine and cyanidation mill were operated regularly. The Wasp No. 2 Co. continued to operate its dry-crushing cyanidation mill, the mine being worked by the open-cut system, using a steam shovel for stripping. The Bismarck mine and mill were idle. The new 50-ton cyanidation mill on the Rattlesnake Jack mine was operated during part of the year. Sinking continued at the Oro Hondo property.

A small production of placer gold was made in Custer, Lawrence and Pennington counties. In Pennington County, experimental milling was continued on the gold-antimony-iron-lead-zinc ore of the Home Lode Co., at Silver City, and development work was done on properties near Hill City. The dredge at Mystic, on Castle Creek, was moved to the John Day district, Oregon.

(Continued from page 8)

great burden that it has been carrying for many years, but there must be active and earnest pressure by every mining man on every legislator who can be reached.

PERMANENT COMMISSION PROVIDED

Mr. Winchell made a motion providing that a permanent commission be created to be composed of five members of the Mining and Metallurgical Society, five members of the American Institute of Mining Engineers, and five members of the American Mining Congress. These fifteen are to name ten other members from districts not otherwise provided for. The commission is to be active the year round in keeping alive the necessity for the revision of mining laws.

Senator W. A. Clark enthusiastically seconded Mr. Winchell's motion.

Continuing the discussion some favored the congressional commission of three members, while others believed five would be better. Mr. Winchell championed the commission of five and apparently succeeded in convincing those assembled that this number would be better in order that as many different parts of the country could be represented as possible.

At the close of the discussion the morning session adjourned.

AFTERNOON SESSION

At the afternoon session, W. L. Saunders, president of the American Institute of Mining Engineers, occupied the chair.

He called upon Senator Smoot for his views in regard to revision of mineral land laws, and for an explanation of his bill looking to this end.

Senator Smoot declared that for twelve years he has been endeavoring to obtain relief from the oppressive features of existing mining laws. He said he had found it very hard to correct one fault without straightening out the entire code.

Senator Smoot in his address presented some of his views with regard to the proposed government leasing policy. These were practically the same as those set forth in the Senator's address printed in the November issue of THE MINING CONGRESS JOURNAL.

EXPECTS BILL TO PASS

Senator Smoot believes that his bill will be passed early at this session. In the Mines and Mining Committee of the Senate there is decided objection to increasing the commission to five. He said the government could amply afford to pay $25,000 to aid the industry which is the very blood of its commercial life. He stated that he does not want the men who may form this commission to be under obligation to any man or any set of men who may raise the money to provide for their expenses and remuneration. He believes it would be a great mistake to have a commission which would serve without pay.

He stated it to be Senator Walsh's idea to have two lawyers on the commission as proposed in his bill. The Senator stated that objection which had been raised to lawyers on the commission, he believed to be without foundation. He pointed, for example, to Judge Nixon, of Salt Lake City, who, in addition to being one of the best informed men in the country on mining laws, is also a man of practical mining experience, one whose judgment could be followed even as to the details of the proper operation of a mine or prospect.

Senator Smoot also explained that the commission should not be limited to metal mining laws. Laws governing coal mines are also in sad need of change he said. He called attention to the fact that Dr. J. A. Holmes, late director of the Bureau of Mines, was very anxious that the laws governing coal mines should be revised along with the mining laws.

Mr. Ingalls called attention to the fact that phosphate and metalliferous minerals often are found together, and that this offered one of the difficulties which would have to be threshed out in the revision of the laws. One of the most famous cases of litigation in the United States, he pointed out, was where a certain kind of mineral in a vein was leased to one person and another mineral in the same vein to another.

Attention also was called to the fact that the tailings of numerous metal mines are said to contain sufficient potash to be available commercially. Chemists are working on the problem of securing potash from this source. Coal and gold are mined from the same shaft in the Transvaal, and other cases were given showing the extreme complexity of the problem which must be laid before the commission.

DIRECTOR SMITH SPEAKS

George Otis Smith, director of the U. S. Geological Survey, was the next speaker. He began his address with this quotation: "Enough, I think, has been adduced to prove that the present law is vicious and inexpedient, that its provisions bear hardly on the mining interests and that it ought to be either repealed or essentially amended." This statement was made by a noted Montana mining engineer in 1868, said Dr. Smith. Even at that time, this authority said the laws resulted in "uncertainty of title, fear of litigation and blackmail."

He used this quotation from Judge Lindley: "In many of its most important features several conflicting opinions have been annunciated by separate courts of equal dgnity and equal ability, until we are almost constrained to say that chaos has come again."

Dr. Smith called attention to the fact that these early authorities believed that the only feasible and statesmanlike solution of the mining law situation was the appointment of a commission to secure testimony, to investigate the whole situation, and report to Congress a general mining code.

This proposition, urged so earnestly fifty years ago is before us, unchanged, today, said Dr. Smith.

Attention also was called to the period of marvelous industrial advance, the progress that has resulted in the geology of ore deposits, and in the technology of actual mining and metallurgy, yet, as Dr. Smith pointed out, there has been no change in the laws governing them.

The situation is simply that of an old law broken down at many points under the strain of conditions that could not be foreseen forty or fifty years ago, he said. The waste rock of a few years ago is now ore, and ore deposits of a type not dreamed of by our fathers, pay the dividends of today. The day of large opportunity for mining is not past. It is our recognition of the extent to which our modern civilization rests upon mining that we are asking a modern code to guide the modern utilization of the great modern resources. In the course of his remarks Dr. Smith called attention to the fact that in 1872 the gold output was 40 per cent of the present; silver 30 per cent, lead 8 per cent, zinc 5 per cent, and copper only two and one-half per cent. We not only consume a larger amount of coal, iron and copper and other minerals per capita, but because of modern civilization, which is becoming more and more dependent on mining, it is certainly better to assist than to obstruct.

Following Dr. Smith's talk, Mr. Saunders stated that Dr. Smith held one of the most distinguished positions relating to the mining industry and that he has discharged the duties incumbent upon him in a manner which reflects great honor on the director of the Geological Survey.

CHANNING TALKS

J. Parke Channing, by use of lantern slides demonstrated very effectively the evils of the apex law and of other laws, his talk bearing upon the properties of the Miami Copper Company. The pictures showed views and sections of the Miami, Inspiration, Keystone, Live Oak and other properties. He also called attention to the fact that had it not been for the development of of the steam shovel, by the mining industry, particularly on the Mesabi Iron Range of Minnesota, the Panama Canal could not have been dug in anything like the time in which it was completed.

Following Mr. Channing's talk, Mr. Saunders referred to him as "one of our noted mining engineers."

Mr. Winchell, by the use of maps and glass slides, explained clearly the difficulties that have arisen under the apex law in the Couer d'Alene district.

Mr. Winchell, as chairman of the committee on resolutions, presented the resolutions which later were adopted practically without amendment. The resolutions adopted appear elsewhere.

LEASING PLAN CONDEMNED

During the discussion of the resolutions, the matter of the withdrawal of certain mineral lands in the West again came up, resulting in several heated discussions.

Mr. Macbeth declared that 62 per cent of Idaho had been seized by the Federal Government, and exempted from taxation. He stated that 1,100 miners in Idaho intended to contest the right of the United States to take a portion of their state, and that they had made all arrangements to carry the matter to the Supreme Court of the United States. He said he would have travelled 6,000 miles before returning to his home, to make just this protest before an assemblage of leading mining men.

Mr. Kirby, while expressing full sympathy for the Idaho miners, declared that the object of the meeting was not a discussion of the government's leasing plan, but the threshing out of the very important matter of revision of mineral laws, which had only indirect bearing on the leasing program.

Messrs. Ross and Kellar, both of whom had expressed views decidedly hostile to the withdrawal of mineral lands, spoke in favor of the prohibiting of any discussion of the leasing system.

Among those who registered were:

A. H. Fay, Bureau of Mines, Washington, D. C.; Chas. E. Munroe, George Washington University, Washington, D. C.; Chambers Keller, Homestake Mining Co., Lead, S. D.; Sidney Jennings, U. S. Smelting & Refining Co., New York; David T. Day, Washington, D. C.; Hennen Jennings, Washington, D. C.; Van H. Manning, Bureau of Mines, Washington, D.C.; H. N. Lawrie, Bureau of Mines, Portland, Ore.; N. H. Wheeler, Penn. Bldg., Phila., Pa.; F. C. Schrader, Mining and Metallurgical Society, Washington, D. C.; A. J. Collins, United States Geological Survey, Washington, D. C.; Morton F. Leopold, Bureau of Mines, Washington, D. C.; W. F. Rittman, Bureau of Mines, Pittsburgh, Pa.; W. W. Adams, Bureau of Mines, Washington, D. C.; Robert H. Chapman, Washington, D. C.; Horace V. Winchell, American Institute Mining Engineers, Minneapolis, Minn.; Geo. E. Collins, Colorado Scientific Society, Denver, Colo.; O. P. Hood, Bureau of Mines, Pittsburgh, Pa.; Geo. S. Rice, Bureau of Mines, Pittsburgh, Pa.; Robert B. Henderson, San Francisco, Cal.; John V. Kirchen, Nevada Mine Operators Association, Tonopah, Nev.; G. S. Patterson, Vivian, W. Va.; S. Sanford, Bureau of Mines, Washington, D. C.; E. W. Parker, Wilkes-Barre, Pa.; Oliver Bowles, Washington, D. C.; Chas. A. Davis, Bureau of Mines, Washington, D. C.; Geo. Otis Smith, United States Geological Survey, Washington, D. C.; Thomas P. Hard, Geological Survey, Washington, D. C.; Arthur S. Dwight, New York; Fred C. Dezendorf, General Land Office, Washington, D. C.; Goodwin H. Williams, General Land Office, Washington, D. C.; Will A. Clark, Butte, Mont.; C. B. Zabriskie, New York; D. S. Jones, Pacific Coast Borax Co.; Geo. S. Pope, Washington, D. C.; N. H. Darton, United States Geological Survey, Washington, D. C.; Jos. W. Krenthue, Bureau of Mines, Washington, D. C.; J. D. Davis, Bureau of Mines, Washington, D. C.; Chas. W. Flora, General Land Office, Washington, D. C.; Clay Tallman, General Land Office, Washington, D. C.; Addison T. Smith, Twin Falls, Idaho; J. W. Thompson, Washington, D. C.; Union B. White, Washington, D. C.; Geo. B. Bush, Riverside, Cal., Midway Northern Oil Co.; Wm. R. Wheeler, Midwest Oil Co., San Francisco, Cal.; H. H. Hill, General Land Office, Washington, D. C.; Van H. Manning, Bureau of Mines, Washington, D. C.; F. F. Sharpless, 52 Broadway, New York City; S. W. Mudd, Los Angeles, Cal.; John V. N. Dorr, 17 Battery Place, New York City; F. W. Bradford, Columbus, Ohio; E. S. Boalich, Washington, D. C.; Frank A. Ross, Spokane, Wash.; Robt. I. Shields, Georgetown, Idaho; Stuart M. Buck, Bramwell, W. Va.; H. M. Chance, Philadelphia, Pa.; Geo. E. Petter, Memphis, Tenn.; Robt. H. Richards, Boston, Mass.; H. W. Hardinge, New York City; R. A. F. Penrose, Jr., Philadelphia.

Pa.; W. R. Ingalls, New York City; Gardner F. Williams, Washington, D. C.; Geo. C. Stone, New York City; R. M. Catlin, Franklin, N. J.; A. F. Lucas, Washington, D. C.; H. C. Perkins, Washington, D. C.; Robert Wilson, Pittsburgh, Pa.; Lawrence Addicks, New York City; J. Gordon Hardy, New York City; Gilbert Rigg, New York City; J. Parke Channing, New York City; Walter Douglas, Bisbee, Ariz.; J. A. Van Mater, New York City; Carl Scholz, Chicago, Ill.; Edmund B. Kirby, St. Louis, Mo.; Paul Wooton, Washington, D. C.; J. F. Callbreath, Denver, Colo.; F. L. Ransome, Geological Survey, Washington, D. C.; A. H. Brooks, Geological Survey, Washington, D. C.

PART OF MINING LAW REVISION COMMITTEE IS APPOINTED

In accordance with action taken at the revision of laws meeting held in Washington last month, the following appointments have been made:

By the American Mining Congress—E. B. Kirby, New York; George E. Collins, Denver; Will L. Clarke, Jerome, Ariz.; George Wingfield, Reno, Nev., and Thomas S. Robinson, San Francisco.

By the Mining and Metallurgical Society of America—Horace V. Winchell, Minneapolis; J. Parke Channing, New York; M. L. Requa, San Francisco; R. A. Parker, Denver, and Seeley W. Mudd, Los Angeles.

The American Institute of Mining Engineers has authorized its president to appoint five members to this committee, but they have not been named as yet.

NEW MEXICO'S MINES SHOW INCREASE OF 60 PER CENT

The output of New Mexico mines for eleven months of 1915, with an estimate for December, as reported by the United States Geological Survey, indicates a yield of $1,500,000 in gold, 2,032,000 ounces of silver, 3,951,000 pounds of lead, 72,000,000 pounds of copper, and 24,640,000 pounds of zinc (in terms of spelter and zinc in zinc oxide), as compared with $1,171,696 in gold, 1,777,445 ounces of silver, 1,763,641 pounds of lead, 59,307,925 pounds of copper, and 18,403,392 pounds of zinc, in 1914. These preliminary figures, compiled by Charles W. Henderson, show an increase of $328,000 in gold, 255,000 ounces of silver, 2,186,000 pounds of lead, 12,674,000 pounds of copper, and 6,237,000 pounds of zinc. With higher values for metals, except for silver, the total value was $18,277,000, against $11,049,932 in 1914, an increase of $7,226,660.

The Mogollon district, Socorro County, 80 miles from Silver City (Grant County), continued to be the most productive district in New Mexico in output of gold and silver. The production in 1915 was $512,021 in gold and 1,319,460 ounces of silver, as compared with $629,102 in gold and 1.410,327 ounces of silver in 1914. The Cleaveland and Weatherhead mine and custom mill were idle the entire year, but the Socorro and Ernestine mines and custom mills were operated steadily on ore from each company's mine and from various other properties in the district. All the ore is milled in the district by concentration, sliming, and agitation and percolation in cyanide solution, the bulk of the product being cyanide precipitates, the balance being high-grade gold-silver concentrates. There was a smaller quantity of concentrates shipped in 1915 than in 1914. An important producer of gold was the Elizabethtown district, Colfax County, there being a small quantity of placer gold and an important quantity of high-grade metallic gold, gold bullion, and concentrates from the Aztec mine at Baldy.

COCHITI DISTRICT IMPORTANT

Another important district was the Cochiti (Bland) district, Sandoval County, inactive from 1904 to 1914, but with a record from 1894 to 1904 of a production of $695,000 in gold and $345,000 in silver. The 100-ton cyanidation plant of the Cossak Company, which commenced operations in September, 1914, was operated nearly all the year 1915 with a very considerable output of silver-gold cyanide precipitates. Continuous output of gold bullion was made from the amalgamation mill on the North and South Homestake mines, at Whiteoaks, Lincoln County. This district has yielded a large quantity of gold. While the yield of metallic gold in 1915 from the Pinos Altos district was not equal to that of 1914, some high-grade shipments were made early in the year, and work was active in the district on the baser metals. The Lordsburg district, Grant County, nearly doubled its shipments of siliceous gold and silver bearing copper and dry ores from fissure veins. The yield of this district in 1914 was $101,080 in gold, 232,647 ounces of silver, and 2,614,674 pounds of copper. A small yield of gold was made from the Gold Hill district, north of Lordsburg. With an increased output of concentrates, the small gold content of the concentrates of the Chino Copper Company in amounts sufficiently large in 1914 to be credited under their smelting contract with 2.71 cents per ton of original crude ore, or 0.1 cent per pound of copper produced, showed an increase. The reopening of the mines and matte smelter of the Santa Fe Gold and Copper Company, at San Pedro, Santa Fe County, in May, 1915, added a considerable quantity of gold to the New Mexico yield. Increased shipments of gold-copper ores from the Jarilla district, Otero County, also contributed to the gold increase.

INCREASED YIELD OF COPPER

Copper has been an important metal in the production of New Mexico. The output from 1845 to 1910 was 92,323,163 pounds, and the total output to the end of 1915 was 318,027,798 pounds. Since 1910 the increased production was due principally to the activity of the Chino Copper Company, which mines with steam shovels a large acreage of low-grade copper deposits at Santa Rita and mills the ore at Hurley in a wet-concentration-flotation plant of five sections. During 1914, this plant treated 6,300 tons a day, calculated on the actual running time, and in 1915 a larger daily tonnage was treated. The gross output in 1914 was 56,841,977 pounds. In 1915 the gross yield for the first three quarters was 48,733,648 pounds and the yield (partly estimated) for the fourth quarter was 20,641,000, a total for the year of about 69,375,000 pounds. During the third quarter an average of 7,504 tons a day was treated, the highest average treated by the mill since the beginning of operations. The yield of copper from the Lordsburg district was nearly doubled, and Oro Grande also contributed an increased yield. The resumption of operations in May, 1915, of the Santa Fe Gold and Copper Company's mines and 125-ton matting plant at San Pedro, Santa Fe County (operated only one month in 1914), added a large quantity of copper to the output. The Burro Mountain Copper Company's new 1,000-ton mill in the Burro Mountain district was operated only part of the time, but development of the mines continued on a large scale. A large tonnage of low-grade copper ore with calcite gangue was shipped from the Apache mine, Hachita. A considerable tonnage of copper ore was shipped from the Organ district, Dona Ana County.

The yield of lead showed an appreciable increase. Lead ores were shipped from the Cooks Peak district, Luna County, from the Organ district, Dona Ana County, and from the Magdalena district, Socorro County.

Heavily increased shipments of zinc carbonate and sulphide ores and zinc sulphide concentrates were made from New Mexico in 1915. At Kelly, Socorro County, the principal producing mines were the Kelly, Graphic, and Juanita. The Ozark mill was operated continuously on the sulphide ores from the Graphic, and the Kelly magnetic mill was completed. At Hanover, Grant County, zinc carbonate ores were shipped from the Hanover and other mines, and the building of a mill for the treatment of sulphide ores at Hanover was commenced. Both zinc carbonate and sulphide ores were shipped from the Cooks Peak district, and carbonate ores from the Florida and Tres Hermanas districts, Luna County. Zinc concentrates were shipped from the wet-concentration-electrostatic mill of the Pinos Altos M. & M. Co. The new magnetic separation mill at the Cleveland mine, at Pinos Altos, was completed and set in operation. A car of zinc ore was shipped from the Hermosa district, Sierra County. The production of zinc ore and concentrates from New Mexico was 39,970 tons of 36.3 per cent, as compared with 29,459 tons of 37.53 per cent zinc in 1914.

CANADIAN MINES CHECK NICKEL DEVELOPMENT HERE

The only possible cobalt-producing properties known to the Geological Survey are those of the Comer Mines Co., Prairie City, Ore., and certain properties at Fredericktown, Mo.

At Fredericktown nickel and cobalt bearing sulphides are separated from galena. At one time an attempt was made to make nickel and cobalt from these concentrates, but the works were closed down and nothing has been done with them for a number of years.

The Key West Co., Bunkerville, Nev., has deposits which carry some nickel. Nickel deposits also exist forty-five miles southeast of Lovelock, Nev. These were owned by Fred Lovelock, who is now deceased, and it is understood that they are now owned by W. J. Flick, Lovelock, Nev., and others. Deposits of nickel silicate exist at Piney Mountain near Riddle, Douglas County, Ore. C. W. Clapp of the Nickel Mines and Smelting Co., Portland, Ore., is believed to be interested in this deposit. Nickel mining was at one time prosecuted at Gap, Pa., but no work has been done since the development of the Sudbury mines in Canada which makes the development of nickel in this country very difficult. The Gap mines are thought to be owned by the Wharton estate.

Withdrawals and Restorations

Summary of principal withdrawals and restorations during the period March 4, 1913, to November 30, 1915 (in acres):

	Outstanding withdrawn Mar. 4, 1913	Withdrawn during period	Restored during period	Outstanding withdrawn Nov. 30, 1915
Coal	65,410,464	436,726	17,402,697	48,444,493
Oil and gas	4,817,706	550,580	538,619	4,829,667
Phosphate	3,367,378	443,972	1,151,214	2,660,136
Potash	133,829	211,384	3,200	342,013
Power site	1,857,258	655,559	165,266	2,347,551
Public water	86,216	98,431	2,702	181,945
Totals	75,672,851	2,396,652	19,263,698	58,805,805

(Continued from page 27)

share of this country's contribution to the world's needs and there is evidence that under the present abnormal conditions our mineral exports are winning for the United States of America a new and larger place in the world market.

In the third of a century just past the exports of foodstuffs, while showing an actual increase in amount, have fallen from 55 to 21 per cent of the total exports, and there has been a corresponding gain in the export of manufactures, from 24 to 58 per cent. Again, by comparing the exports of 1880 with those of 1913, the latest year unaffected by abnormal conditions, it is found that the value of exports of mineral products and manufactures thereof has increased from less than 4 per cent to 42 per cent of the total exports, an increase amounting to more than one and one-half billion dollars.

DEVELOPMENT RAPID

The epoch of rapid growth of the mineral industry in the United States began about thirty-five years ago, and this third of a century has witnessed wonderful development. Clarence King, in the first administrative report of the United States Geological Survey, analyzed the situation in 1879 in these words: "We are yet at the very threshold of the industrial life of the republic," and looking forward, he added: "The mineral industries will soon reach an annual yield of a thousand million dollars of value." May I now remind you that five times already our country's annual mineral production has exceeded two thousand millions of dollars?

For this period of development since 1880 statistics of the mineral production are available, so that the extent of the expansion of the industry can be summed up in the statement that the value of the output has increased nearly seven-fold, while our population has less than doubled. If we compare directly the output per capita of population the record of increase in the output of the more important mineral products becomes really instructive or even inspiring. Thus in this period of thirty-three years, the production and consumption of coal per capita have increased from less than a ton and a half to nearly six tons—an increase of 357 per cent. Similarly, the per capita production of iron ore increased 337 per cent, petroleum, 391 per cent; copper, 1,290 per cent, cement, 2,087 per cent; gold and silver increased only 23 and 22 per cent respectively, but lead increased 125 per cent, and zinc [illegible] per cent. This is a record of which mining men of this generation may be proud.

COMPARED WITH AGRICULTURE

If statistics for the more important agricultural products are studied in a similar manner, it is found that the total increase during the same period has not much more than equaled the growth in population. This is true of the two leading grains, corn and wheat, the one having somewhat more than doubled and the other not quite doubled in the third of a century, so that the production per capita shows only a small percentage of increase. In cotton the gross increase has been larger, approaching 130 per cent, but wool has failed to increase as rapidly as the population. It is only sugar that shows an increase, both in domestic production and in consumption, at all comparable with that of most of the minerals mentioned, the per capita increase being 394 per cent, or about the same as that in the other carbon compounds, coal and petroleum.

SOUTH SHOWS UP WELL

Especially notable in this period of phenomenally rapid strides has been the industrial development of the New South, which has more than kept pace with the country as a whole. In 1882 the Southern States produced only 8 per cent of the mineral output of the country; in 1890, 14 per cent; in 1900, 16 per cent; in 1910, 19 per cent, and in 1914 their output was 22 per cent of the total mineral production. Thus the South, with steady gains, has been utilizing that share of industrial opportunity afforded by its varied wealth of mineral.

Dr. Chance[5] lately remarked that what is sometimes called engineering efficiency, is "more broadly described by the term conservation of labor," and so in any discussion of the national significance of advances in engineering it is important to realize that the object of the engineering sciences is simply to win the largest results with the least possible expenditure of labor. If a poet ever seeks a theme in the story of the mines, he should write the epic of this struggle of man with mountain masses, where victory comes only through the harnessing of Titan power. Today, huge steam shovels mine iron and copper and coal, and giant electric dredges win the gold from gravels that are too poor to work by less efficient methods.

ELOQUENT FIGURES

Thus it follows that the most gratifying phase of this mining development is the marked increase in man's productive capacity. Let us take the 20-year period, 1889-1909, and analyze the coal-mining record. Roughly stated, the number of mine workers has a little more than doubled in that period, the output of coal has more than trebled, and the capital investment has more nearly quadrupled. The exact percentages of increase are 123 per cent in employes, 226 per cent in production, 252 per cent in capital. Stated in terms of efficiency, the mine worker increased his individual output from 471 to 691 tons a year, while the average annual output per dollar of capital remained nearly the same, about two-fifths of a ton, the increase in capitalization per ton of output being less than 8 per cent.

---

[5] Chance, H. M., address at Pennsylvania State College, Nov. 5, 1915.

IRON'S GOOD SHOWING

In iron mining the record for the same period is even more striking; the number of miners increased less than one-half, the capitalization nearly trebled, and the output nearly quadrupled. In the iron mines, then, both labor and capital became more efficient, the output per miner increasing from 385 to 995 tons and the production per dollar of capital from one-seventh to one-sixth of a ton, and this improvement did not halt with the census year of 1909. All this tells the story of steadily increasing efficiency of mine worker, mine equipment, and mining methods—that is, of the contributions by labor, capital, and engineering.

The human aspect of this picture of change in the mining industry is full of encouragement to every one interested in the welfare of his fellow citizens. That type of industry is to be desired which employs a maximum of skilled labor and a minimum of "muckers." The labor of any country is most benefited by the export of finished products rather than crude ore and by the import of raw materials rather than manufactures. Looking at the question from the standpoint of the United States, it is the product of American labor rather than the bounty of our natural resources that should go into the world's markets, for betterment of industrial conditions can come best through expansion of manufacturing. The increase in the element of labor in the product exported will mean that we are not bartering away our heritage of natural resources, but rather that we are using these resources as a basis simply for the expenditures of labor, which renews itself.

DIVERSITY INCREASING

Confidence in the future of the mineral industry may be strengthened by even a passing glance at its increasing diversity. The statistics of mineral production in the United States in 1880 covered fifty-one mineral products, whereas the table of production for 1914 contains no less than ninety-five items, and the accompanying report mentions eighty-nine other minor products. Since 1880 the baser metals have come to the front, and indeed the nonmetals once of subordinate rank now exceed in total value the metals. Moreover, the small increase in the output of gold and silver has been made in part with both these noble metals in the rôle of by-products from copper and lead mines.

BY-PRODUCTS

The subject of by-products stimulates inspiring thought. Under the exceptional demands of the year just past, sulphuric acid, which has been a source of embarrassment to the smelter operator, has become a commodity of great price. Dr. Douglas, indeed, in observing the advances in blast-furnace operation, once raised the question whether eventually pig iron will be "the principal object of manufacture or one of the by-products." In the case of that highly useful metal, platinum, of which the United States, unfortunately, has an insufficient supply—the amount won in the refining of gold bullion and copper matte of domestic origin is four-fold the small quantity obtained from our platinum ores and concentrates. The metals selenium and tellurium are produced in the electrolytic refining of copper or may be saved from smelter fumes, and if uses are found for these metals considerable demand can be met by the supply from these sources.[6] Gallium, hitherto hardly more than a curiosity among metals, is now recovered as a by-product in zinc redistillation in quantities sufficient for a real test of its possible uses.

BETTER LIVING CONDITIONS

Along with all this marvelous increase in material production, it is gratifying to note again that most of the development has been of the type that betters the conditions of living. During the period of marked growth, metal mining, for instance, has passed from the exploitation of bonanzas to the working of low-grade deposits, a change which, as Dr. Raymond has remarked, by creating larger and more permanent communities has laid safe foundations of civilization and progress. Thus does the utilization of our mineral resources measure up to the higher standard of public service by building homes and giving all the workers a better opportunity to live a full life. This is the ideal of democracy.

The relation of mining to other industries deserves a passing word. Speaking of the era of mineral exploration that began with the finding of gold in California and Australia, Mr. Rickard[7] has termed that discovery "the prelude to a world-wide migration, an enormous expansion of trade, a tremendous advance in the arts of life, and the spread of industry to the waste places of the earth." The miner has ever been the pioneer of civilization. The history of the winning of our own West has been in large measure the story of the rancher that followed the miner, and the railroad builder that followed both. This vital interrelation between mining and agriculture and transportation continues to this day.

CONTRIBUTE TO DEVELOPMENT

Both the past record and the present status of the mining industry show that the mineral resources of the United States possess largest public value in their indirect contribution to national development. Even in the case of certain mineral deposits in public ownership the substitution of a leasehold system for the other form of mineral-land tenure may better be sought for the purpose of insuring development and beneficial control of operation than with an eye single to the amount of royalty possible from production under the lease. In fact, it may be easily shown that the State or nation will not be so much benefited through a direct royalty as through the indirect revenue gained by the establishment of a new industry, and by its influence on the neighboring agricultural areas and the transportation systems to which the new traffic is tributary. The value of the direct and indirect benefits cannot easily be appraised and compared, for prosperity cannot be weighed.

---

[6] Hess, F. L., U. S. Geol. Survey Mineral Resources, 1914, pt. 1, 1916.
[7] Address at Columbia School of Mines, May [illegible], 1914.

TONNAGE TAX INEQUITABLE

The difficulties as well as the inequities that would attend the imposition of a tonnage tax or even a tax on gross proceeds may be illustrated from current mining statistics. The net proceeds per ton of ore produced in one mine may exceed the gross value per ton of the ore produced in another: and in still another mine with even richer ore, heavy costs may leave little or no margin of profit. Whatever the basis of the public's claim for revenue, the determination of a proper royalty presents great practical difficulties, yet, by imposing a fair tax on earnings, similar to the present corporation tax, the desired results are secured. If taken in large units, the income from mining shows a fairly definite percentage on output. Thus in 1913 the dividends paid by the successful metal mines in Utah[8] amounted to five and one-half million dollars, or about one-eighth of the gross output of all the metal mines in that State. Or, taking a longer period, the aggregate dividends paid by mining companies of the Tintic district in Utah in about forty years are estimated at twenty-seven and one-half million dollars, or more than one-sixth of the total production for that period.[9] Other districts might be cited where the dividends paid are at the rate of $3 or $6 or more per ton of ore mined, yet in equally successful mines the large dividends paid may represent only 50 cents per ton. However great may be the variation in earnings and losses, as figured on the tonnage basis, the aggregate dividends distributed are large and represent on the average an appreciable fraction of the gross value of the output. And under existing laws these profits of mining pay tribute to the nation's need.

SWELL INCOME TAX

The importance of the income tax now paid by the mining corporations may be shown by the fact that under the market conditions of the year just past, several of the largest copper companies will probably pay into the national treasury something approaching a mill on every pound of copper sold or perhaps $2 a ton. For this exceptional year the Federal corporation tax on copper mines alone may total a million dollars. In a State where net proceeds are taxed not less than half a million dollars of State revenue are expected from two large mining companies.

TAXATION DISTINCTIONS

Whether the mineral resources are in private or in public ownership, even a hasty consideration of the subject suggests the need of making a distinction between minerals in which the domestic and foreign competition is sharp and those in which the margin of profit is so large that the tax will neither affect the nation's ability to compete in the world market nor increase the price to the domestic consumer. In short, the public's direct share of the proceeds from mineral resources must not be so great as to affect unfavorably labor's opportunity or capital's incentive.

Because of the essential relation between the mineral resources of a country and its prosperity, both national and international, there rests upon the public a continuing obligation to the mining industry. The modern doctrine of conservation was well expressed by Dr. Raymond nearly 50 years ago in his first report on Mineral Resources.[10]

"In view of these peculiar relations of mining, it is evident that governments are in a certain sense trustees of the wealth stored in the mineral deposits of their realms——trustees for succeeding generations of their own citizens and for the world at large. It is not a matter of indifference to the citizens of this country whether our mining fields be ravaged and exhausted in one or even five centuries, when they might last a score."

MUST CHECK WASTE

The governmental duty to the mining industry first of all is to promote use without waste. The educational and investigative work of the Government scientific bureaus is the nation's contribution, and in this application of science to the promotion of the general welfare of the industry, the chemist and the engineer, the geologist and the metallurgist cooperate; and the large service rendered through the collection and publication of scientific statistics of mineral production and of mine accidents has won from the industry deserved recognition. The Government aid extended to any industry may better take the form of real leadership in applied science than of ingenious schemes of artificial stimulation. W. R. Whitney[11] has accurately stated this relation: "Search for new knowledge is the insurance for the future of the industries."

Equally important, if not indeed altogether imperative at this time, is the need that the public support only such proposed legislation as may promise to encourage engineering efficiency in the mining industry. The public interest requires that the idea of the Government as a trustee be kept in mind, yet it is no less essential that the trustee fully appreciate just to what extent individual initiative, and especially corporate effort, are attaining some of the very ideals desired in the public interest.

---

[8] Heikes, V. C., U. S. Geol. Survey Mineral Resources, 1913, pt. 1, p. 374, 1914.

[9] Heikes, V. C., op. cit., p. 395.

[10] Raymond, R. W., Mineral Resources of the States and Territories, p. 176, 1869.

[11] Am. Acad. Polit. and Soc. Science Annals, May, 1915, p. 94.

By its constructive effort the large unit in production—"big business," if you please—is winning such victories in the largest and wisest use of our mineral resources that its public-service nature is becoming apparent. Public regulation of private operation is the people's safeguard, but regulation need not be active as long as these great industrial units are seeking larger profits, not by artificially curtailing production or raising prices, but rather by eliminating waste and lowering costs. The larger dividends paid by mining companies today are won not so much through monopolistic control of virgin bonanzas, as through the possession of tracts of mineral land big enough to warrant great expenditures of engineering skill. It is the day of large returns from lean ores. The net result of this type of exploitation is to increase, rather than to decrease, the nation's resources. Even concerning an expendible resource, it is in a sense true that "there is that scattereth and yet increaseth."

BIG COPPER RESERVE

Seven years ago Professor Lindgren, in discussing the visible reserves of copper ore in the United States, itemized the estimates for four districts in three States, for which he obtained a total of about 160 million tons of developed reserves, and his comment[12] was, "Each year will, however, surely find extensions of reserves added to those already discovered." Now, indeed, these four districts have known ore reserves amounting to over 600 million tons, not to mention 60 million tons already mined, mostly in these few years. Nor is this gratifying increase due alone to the exploratory work of the mining engineer. Since 1906 the average recovery from United States copper ores has decreased from 50 pounds of metal per ton to 32 pounds.[13] This change in quality of ores mined and treated is due more to the improvement of methods than to the exhaustion of the richer deposits. The continued lowering of the cost of mining and treating a ton of ore has made possible this reduction in the grade of ore that can be profitably handled, and the result is a corresponding increase in the copper ore reserves of the country. Thus do the engineers and metallurgists work together to place the copper industry upon a more lasting foundation, and with this constant improvement in mining methods and mill and smelter practice, nothing less than an annual inventory of the nation's mineral resources can keep the people truly informed.

COAL RESERVES

The only increases in known mineral reserves comparable with that credited to the copper companies are the equally important changes in the estimates of this country's phosphate and coal reserve. The field work done by the United States Geological Survey during the last six years has increased the known reserves of phosphate rock in the publicly owned lands of the Western States from a few hundred million tons to more than five billion tons. As for coal, the quantity of easily accessible anthracite and bituminous coal exceeds the estimated tonnage in 1909[14] by 440 billion tons, an increase of nearly 30 per cent. This change in Mr. Campbell's estimates is due almost wholly to the work done in the intervening few years under his direction by Government geologists in classifying and valuing public coal lands.

The day of large opportunity for both exploration and investigation of the mineral resources of this country is not past. In this time of adjustment to special demands it is easy to be optimistic regarding future advances along all the engineering lines leading to the full utilization of our mineral wealth.

The recognition of the extent to which modern civilization rests upon mining and the realization of the consequent need of promoting efficiency in mineral production will insure the placing of the proper estimate of value on the public interest in mineral resources. As the nation's future welfare depends on the continued productivity of our mines, it follows that even if the nation's mineral wealth does greatly exceed that of any other country, the public interest requires that no part of it be squandered.

AMERICAN INDUSTRIES HURT BY PLATINUM EMBARGO

A serious condition for the consumers of platinum in the United States has been precipitated by the action of Great Britain in declaring an embargo on the metal, according to experts at the United States Geological Survey. Not only has the price of platinum become prohibitive, but it is almost unobtainable in any equantity at the exorbitant rates being asked.

Some good is resulting from this condition, however, due to the stimulation which is given prospecting as a result of the very high prices. The benefits which may be derived from this, however, is nothing to compare to the economic loss which is resulting, as there can be no reasonable hope of developing platinum in quantity in the United States.

The manufacture of platinum jewelry is practically at a standstill. The use of this metal in the arts has been discontinued practically. Dentists are using platinum scrap and are substituting other metals wherever possible.

The development of the Rambler mine in Albany County, Wyoming, has been hastened greatly by the high price of platinum. It is expected that this property will produce this year. The platinum in this mine is combined with copper and silver.

---

[12] Lindgren, Waldemar, Papers on the conservation of mineral resources; resources of the United States in gold, silver, copper, lead and zinc; U. S. Geol. Survey Bull. 394, p. 142, 1909.

[13] Butler, B. S., U. S. Geol. Survey Mineral Resources, 1914, vol. I, p. 555, 1915.

[14] Campbell, M. R., Papers on the conservation of mineral resources, coal fields of the United States; U. S. Geol. Survey Bull. 394, p. 8, 1909.

Mineral Land Decisions

Instructions have been issued to the commissioner of the General Land Office in the matter of exchange Indian allotments on the Fort Berthold Reservation of North Dakota. The commissioner has been ordered to proceed with the allotments of these Indian lands regardless of their coal character. The trust patents covering the original allotments were surrendered and properly liquidated for cancellation. The commissioner was directed to issue new patents of like form. Trust patents, however, were not issued because of the reported coal character of a large part of the land.

The director of the Geological Survey on April 17, 1911, submitted to the Indian office his report showing that the tracts which include many of the exchange allotments were coal lands. More than 2,000 acres show the presence of coal. On the strength of this report a withdrawal order was signed by the Secretary of the Interior on June 27, 1911.

An act passed August 3, 1914, provides for a classification and appraisal of the surface of the reserved coal area of the reservation and to sell and dispose of it with a reservation of the coal. Provision was also made for the disposal of the reserved coal deposits.

After the passage of the act, and before the coal classification and withdrawal were made, many allotments were filed in the coal area.

On the occasion of a similar question on the Fort Peck Indian Reservation the commissioner of the General Land Office was advised as follows:

"In view of the fact that the allotments were made prior to the time when they were known to be coal in character, and of the departmental decision in question, it would appear that patents should be issued in regular order upon this allotment in the absence of other objections."

The Fort Berthold allotments were made in the fall prior to the act of June 1, 1910, and were not pursuant thereto. They were scheduled regularly and submitted thereafter to the department for approval and actually were approved for trust patent by the department, all prior to the report and classification made by the Geological Survey, and prior to the withdrawal order which followed.

As a consequence, the secretary has ruled that these allotments, and the approval granted, should stand and be held intact notwithstanding the subsequent classification and withdrawal, and that in the absence of other objections the proper trust patents should be issued.

COAL APPLICATIONS REJECTED

With the exception of a modification affecting one claim, the decision of the commissioner of the General Land Office rejecting important coal-land applications of the Alaska Petroleum & Coal Co., has been affirmed by the Secretary of the Interior.

The properties involved are in the Juneau land district of Alaska. There are twelve coal claims claimed by the company.

Charges filed by the commissioner of the General Land Office are as follows:

"1. That the claimants did not make their respective locations and filings for their own exclusively individual use and benefit; but that they and each and every one of them prior to making said locations and filings on and for the lands involved, entered into an agreement or understanding with each and every other one of them whereby it was agreed and understood that after obtaining patent for said lands that they would consolidate and combine and hold the lands embraced in the locations and filings for their joint use and benefit. This agreement was carried out in the making of the locations and findings.

"2. The claimants did not locate in good faith all the lands embraced in their findings with the intent that the legal title to the lands covered by the filings should be acquired pursuant to the laws of the United States governing the entry, sale or disposition of public lands available for the coal deposits contained therein, for the separate and several uses and benefits of the individual claimants, but each of said locations was made pursuant, as above, to the unlawful purpose that the title acquired should inure to the use and benefit in equal measure to the entryman, and to each and every one of the several other persons by whom coal declaratory statements, mentioned above, were made, or to the use and benefit of an association or corporation by them formed or members and stockholders by themselves or an association with such other persons as they might attempt or who might secure entries therein.

"3. That the locators or claimants of the several tracts and parcels of land covered by and embraced within the coal declaratory statements, and did not prior to making such location or at any other time thereafter and prior to filing notices of said location, open or improve any mine or mines of coal in and upon any of the said tracts of land."

The charges were denied. Testimony was taken and the legal officers rendered a decision holding that the Government had conclusively established the truth of charges No. 1 and No. 2, and a portion of No. 3.

Upon appeal from this action the decision of the legal officers was modified by the commissioner to the extent that it was held that the charges had been sustained as to all the claims and that the application in this entry should be rejected. Further appeal was taken to the Secretary of the Interior.

A study of the record convinced the department that charges No. 1 and No. 2 had been sustained and the Fremont claim, one of the group of twelve, was thought to have been handled in a legal manner. After extensive examination of this feature of the case, the Secretary overruled the commissioner in his decision that all the applications should be rejected.

As to the Fremont claim, the department fails to find any sufficient evidence of fraud or proof that the claim was not located for the individual use and benefit of the locator, while a mine of coal had been opened and improved prior to withdrawal, and such development continued diligently thereafter. Accordingly, in the absence of other objection, patent has been ordered issued in the Fremont claim, but application is denied on all the other claims and locations involved in the case.

INCREASES RATE.

Coal land covered by the appeal of Effie A. Hard must be paid for at the rate of $20 per acre, according to a ruling by the Secretary of the Interior in which he upholds the previous decision of the commissioner of the General Land Office.

The tract in question is in the Vancouver land district of Washington. The land is embraced in the executive coal land withdrawal of July 7, 1910, and of the departmental withdrawal of December 17, 1906. The executive withdrawal remained effective until December 2, 1913, when it was revoked. On January 31, 1913, Effie Hard filed a coal declaratory statement for the tract, alleging possession thereof February 15, 1904, and the opening and improving of a mine of coal thereon October 25, 1907. This filing, however, was rejected by the commissioner's decision of April 24, 1913, for the reason that the withdrawal of the land made it not subject to such filing.

Subsequently, the claimant filed application to purchase the tract, alleging the performance of certain work on the claim at a cost of $700. She announced her intention of opening and improving a mine of coal upon the property. It was alleged that the work was commenced in 1902 and continued during various years down to and including 1913. This work, it was also stated, resulted in the opening and improving of two mines in the tract. The affidavit was made on the usual form, but was amended so as to state that no portion of the land was wholly or in part within fifteen miles of a completed railroad. Payment for the land was made in the sum of $1,600, or at the rate of $10 per acre, and final certificate of entry was issued.

Upon consideration of the entry the commissioner found that at the date of the entry the land was within less than fifteen miles of a completed railroad, and demanded that an additional payment of $10 per acre should be made under penalty of suffering the cancellation of the entry.

The claimant contends that inasmuch as she has shown that there was no completed railroad within fifteen miles of the land, she initiated a claim to the tract by opening and improving the mine, she should be held to be within the terms of the coal-land regulations. She further urges that the land having been unsurveyed at the time she initiated her claim thereto, that it is the right of the claimant to make payment of the land in accordance with the conditions existing at the time of the initiation of the claim rather than with respect to conditions prevailing at the date of entry.

The law in this regard, however, reads as follows:

"Every person shall, upon application to the register of the proper land office, have the right to enter by legal subdivisions any quantity of vacant coal lands upon payment to the receiver of not less than $10 per acre for such lands where the same shall be situated more than 15 miles from any completed railroad and not less than $20 per acre for such lands as shall be within fifteen miles of such road."

This law is amended and the language of the amendment standing alone seems to support the claimant's views. It was, nevertheless, intended by the department to apply only to coal lands whose price, between the date of the filing of an application or the initiation of a claim thereto and the time of the completion of the proceedings, had been increased by departmental appraisals or reappraisals. Not only was the amendment not intended to apply to a case like this one which is automatically under the express provisions of the statute included above. The secretary held that no reason existed for changing the decision of the commissioner and the land must be paid for at the rate of $20 per acre.

CALIFORNIA IS ONLY PRODUCER OF CHROMITE

California is practically the only producer of chromite in the United States. The principal mine is near Dunsmuir, Cal., and owned by J. B. Huffard, Mills Building, San Francisco, Cal., who controls several other chromite mines in the State.

Chromite is being produced also in Fresno County, Cal., by the Levansaler-Speir Corporation, 251 Monadnock Building, San Francisco, Cal., and in Nevada County by the Zenith Iron Co., near Forbestown, Cal. Besides these, small quantities of chromite have been produced from sand that has been washed in the vicinity of Baltimore, Md.

Operating New Zinc Plant

An experimental zinc plant is being operated by the Anaconda Copper Mining Co. As the work being done is purely of an experimental nature, no information as to results is being given out.

Current Federal Legislation

Thus far 9,619 bills have been introduced in Congress—2,845 in the Senate, and 6,774 in the House of Representatives.

A digest follows of such of these bills as are of most interest to mining men. Effort will be made to furnish the full text of any of these bills to any who may make request for same to the American Mining Congress.

SENATE BILLS

S. 44, by Senator Smoot, provides for the acquisition by a State of any lands therein which are chiefly valuable for the development of water power, and that any State desiring to avail itself of the provisions of the act shall through its regularly created board, commission or other regularly constituted public authority, vested with power to regulate and control rates and service of public utility corporations, file with the Secretary of the Interior an application setting forth the description of the lands sought, accompanied by a map, together with proof that the lands are chiefly valuable for the development of water power. It is provided that this act shall apply to any part of the public lands of the United States, reserved or unreserved, including national forests, national monuments and Indian reservations, provided it does not interfere with the purpose for which the same are created.

S. [illegible], by Senator Smoot, provides for the application of a portion of the proceeds of the sales of public lands to the endowment of schools or departments of mines and mining. Mr. Smoot asks that $5,000 be appropriated from the sale of lands the first year, $10,000 the second year, $15,000 the third year, $20,000 the fourth year, and for each succeeding year the sum of $25,000, to be used for the establishment and maintenance, under control of the Secretary of the Interior, of a school or department of instruction in mines and mining. If in any State or territory there is already established a school of mines, then the money appropriated shall go to this school. The money so appropriated shall be expended only for instruction, research and experiment in mining, mining engineering, ore treatment, metallurgy, assaying and chemistry and geology. If any State has no school or department of instruction in mines or mining, then the Secretary of the Interior shall designate some accessible and convenient place where the school of mines shall be located.

S. [illegible], by Senator Smoot, provides for a commission to codify and suggest amendments to the general mining laws. A full discussion of this bill, as well as that of Representative Taylor, appears in this issue in the account of the revision of mining laws meeting. (Referred to committee on Mines and Mining and favorably reported December 16, 1915.)

S. 84, by Senator Smoot. This bill provides for an increased annual appropriation for agricultural experiment stations, to be used in researches in home economics.

S. [illegible], by Senator Gronna. This bill provides for the disposal of coal or coal lands and provides that such lessees shall fix the maximum prices at which coal shall be sold to the public and that any act in restraint of trade shall work a forfeiture of the lease.

S. [illegible], by Senator Gronna, provides for the classification of the public lands of the United States, and that all patents hereafter granted under any of the public land laws of the United States shall contain an express reservation of all deposits of phosphate, oil, asphaltum, natural gas, coal, legnite or associated minerals.

S. [illegible], by Senator Gronna, provides for the leasing of phosphate, oil, asphaltum or natural gas lands.

S. [illegible], by Senator Gronna provides for the granting of permits for the use and occupation of lands of the United States for the development of water power under the provisions of the act of February 16, 1901.

S. 673, by Senator Clapp, defines unfair discrimination and makes same unlawful.

S. 682, by Senator Poindexter, provides for mineral entries on lands in Indian reservations, with the provision that each producing mine developed shall be subject to a levy by the Secretary of the Interior of a reasonable royalty. Funds thus collected are to be paid into the tribal funds of the tribe on whose reservation the mineral deposit was found.

S. 775, by Senator Walsh. This bill provides that all lands belonging to the United States containing deposits of carnotite, pitchblende or other ore containing radium in sufficient quantity for extraction, shall be subject to occupation and purchase under the mining laws, providing the United States shall have the exclusive right to purchase such ores at the market value of same when removed, and also in case of failure of the occupant to develop and mine such ores with reasonable diligence, that the United States shall have the right to mine the ore, paying to the owner the market value thereof, less the cost of mining. It further provides that in case the United States shall fail to purchase any such ores upon tender of same in carload lots at any railroad station, the exclusive right to purchase or mine the ore upon said claim shall terminate. The bill further provides that the disposition of radium bearing ores located under the provisions of this act shall be unlawful and subject the owner upon conviction, to a fine of not less than twice the value of the ore so disposed of. The bill also provides an appropriation of $150,000 for the erection of a radium extraction plant, and $300,000 for the expense connected with the purchase and treatment of radium bearing ore during the first year. The bill further provides that radium-bearing lands within Indian reservations shall be subject to the same rule, royalties to be paid the Indians entitled to occupy such reservation.

S. 777, by Senator Walsh, provides for the encouragement and promotion of the mining of coal, phosphate, oil, gas, and sodium on the public domain. *Coal*—Deposits of coal on land owned by the United States, outside of Alaska may be acquired under the provisions of the existing law (see 2347 to 2352, U. S. Revised Statutes), or same may be leased by the Secretary of the Interior through competitive bidding or such other methods as he may adopt, in block or tracts of 40 acres each, or multiples thereof, and in such form as in the opinion of the Secretary of the Interior will permit the most economical mining. In no case may the tracts exceed 2,500 acres. No tract is to exceed in length two and one-half times its width. For the privilege of mining and disposing of the coal the lessee shall pay to the United States such royalties as may be specified which shall not be less than 2 cents per ton in addition to the rental of 25 cents per acre for the land for the first year, 50 cents per acre for the second and third years and $1 per acre for each year thereafter. Leases are to be for indeterminate periods upon condition of continued operation. Exception is made when operation is interrupted by strikes or other matters outside the power of the lessee. Each twenty years the lease is to be subject to readjustment. *Phosphates*—Leases of phosphate land are not to exceed 2,560 acres. The lessee is to pay to the United States royalties not to be less than 2 per cent of the gross value of the output of phosphate at the point of production. Annual rental is to be charged at the rate of $1 per acre per year. *Oil and Gas.*—The Secretary of the Interior is authorized to grant a prospecting permit giving exclusive right for a period not exceeding two years, to search for oil or gas upon a tract not exceeding 640 acres, if the tract is within 50 miles of a producing well. If it is situated over 50 miles from a producing well the extent of the permit may be increased to 2,560 acres. Mining operations must begin within four months from the date of the permit. After one year a well must have been driven to a depth of at least 500 feet. At the end of two years a well must have been driven to a depth of 2,000 feet. On establishing the occurrence of oil or gas in valuable amounts the permittee is to be entitled to patent one-fourth of the land covered in his prospecting permit. *Potassium or sodium*—The prospecting permit on lands containing chlorides, sulphates, carbonates, borates or nitrates of potassium or sodium may cover 2,560 acres. On proving that valuable deposits have been discovered the permittee is entitled to patent 160 acres of land embraced in the prospecting permit. The remainder of the tract covered by the permit is to be subject to lease by the Secretary of the Interior.

S. 785, by Senator Walsh. This bill provides for the leasing of any unpatented oil and gas lands included in any order of withdrawal, upon which oil or gas has been discovered, was being produced, or upon which drilling operations were in actual progress January 1, 1914, upon claims located prior to July 3, 1910, upon the relinquishment or surrender to the United States within six months from the date of this act by any locater or his successor in interest.

S. 875, by Senator Smith, of Arizona, provides that the mineral lands of the United States shall not be affected in any way or the manner of acquiring title be altered or modified by reason of such lands being included within any reservation created by executive order.

S. 869, by Senator Pittman. This bill provides for the establishment of a commission form of government in the administration of national affairs in Alaska. An administrative commission of five members is provided. The governor of Alaska is to be ex-officio chairman of the commission. The Surveyor General of Alaska is to be a member of the commission. The President, with the consent of the Senate, is to appoint the other three members. Two of the five members of the commission must have been residents of the territory for at least five years. Not more than three of the members shall belong to the same political party. The term of office for each member is four years. The President, however, has the right to remove any member. During his term of office each member shall reside in Alaska and shall not engage in any other business. The board is to hold its sessions and conduct its business, so far as is possible, in Juneau. All power and authority now vested in the commissioners of Indian affairs, the Bureau of Education, the Director of the Bureau of Mines, the General Land Office, Forest Service, Biological survey work, agricultural experiment stations, and fisheries service is to be transferred to the Alaska commission. The bill provides for the centralization in Alaska of practically all of the Governmental functions.

S. 1351, by Mr. Works. This bill provides for the discovery, development and protection of streams, springs and water holes in the desert and arid public lands of the United States in the State of California, and for rendering the same more accessible, and for the establishment of sign boards and monuments locating the same. This bill is identical with S. 487, of the Sixty-third Congress and was favorably reported by the Committee on Public Lands, December 17, 1915.

S. 2293, by Senator Shafroth, provides that all lands included in waterpower site withdrawals shall be subject to entry location and disposal under the public land laws applicable thereto with condition that any refusal of the owner thereof to obey the order of a State tribunal concerning the rates charged for electricity shall work a forfeiture to the United States of all claim or title to such lands.

S. 2844, by Senator Kern. This bill provides for the creation of a Bureau of Labor Safety in the Department of Labor. It provides for a Commissioner of Labor Safety who shall head the bureau, to be appointed by the President, and receive a salary of $5,000 per year. Its duty will be to make general and special investigation and examination of labor safety plans and devices of all kinds, and the study of methods for the prevention of vocational diseases. A bill for the same purpose, H. R. 153, by Mr. Mann, has been introduced in the House of Representatives.

HOUSE BILLS

H. R. 18, by Mr. Taylor, of Colorado. This bill provides for a commission to codify and suggest amendments to the general mining laws. A full discussion of this bill, as well as that of Senator Smoot, appears in this issue in the account of the revision of mining laws meeting.

H. R. 96, by Mr. Cullop, makes unlawful the owning or leasing coal lands by common carriers except as may be necessary and intended for use in the conduct of its business. It also prohibits a common carrier to lease or sell, upon a royalty basis to any person, firm, or corporation, any lands underlain by coal, or any coal underlying any lands, whether the ownership of such lands and coal, has been, or may hereafter be, acquired by it. It provides that after January 1, 1916, it shall be unlawful for any common carrier to transport from any State, territory, or the District of Columbia, to any other State, territory or District of Columbia, or to any foreign country, any coal or products of coal, or products of land underlain by coal, manufactured, mined or produced by it, or under its authority, or by any firm, or corporation to whom the common carrier may have or hereafter may lease or sold upon a royalty basis any lands underlain by coal, except such coal or products as may be necessary and intended for its use in conducting its business as a common carrier.

H. R. 153, by Mr. Man. Providing for the creation of a Bureau of Labor Safety in the Department of Labor. See review of S. 2844, by Senator Kern.

H. R. 174, by Mr. Mondell, provides that all mineral locations on public lands after the enactment of the act shall reserve to the United State a preference right to purchase at a fair and reasonable price all radium bearing ores taken from such lands.

H. R. 175, by Mr. Mondell. This bill provides for the leasing of oil and gas lands, and for the exclusive right of the United States to take so much oil and gas produced therefrom as may be necessary for the use of the Army, Navy or Revenue Cutter service, paying therefor a reasonable and remunerative price. The bill fixes the royalty to be paid to the United States at one-tenth the value of the product at the well.

H. R. 232, by Mr. Wickersham. This bill provides for the establishment of a commission form of government in the administration of national affairs in Alaska, which shall consist of a commission of five members. This bill is substantially the same as S. 896 introduced in the Senate by Senator Pittman.

H. R. 242, by Mr. Stephens, of California, provides for the discovery, development, and protection of streams, springs, and water holes in the desert and arid public lands of the United States, for rendering the same more readily accessible, and for the establishment of and maintenance of signboards and monuments locating the same. (Same as S. 1351 by Mr. Works.)

H. R. 406, by Mr. Ferris. This bill provides for the exploration and disposition of coal, phosphate, oil, gas, potassium or sodium. Substantially the same as S. 777, by Mr. Walsh.

H. R. 408, by Mr. Ferris, provides for the development of water power and the use of public lands in relation thereto. The Secretary of the Interior is authorized by this bill to lease to any citizen, association or corporation, any part of the public lands of the United States, including Alaska, reserved or unreserved (excepting national parks or military reservations) for a period of not longer than fifty years, for the purpose of constructing, maintaining and operating dams, water conduits, reservoirs, power houses, transmission lines, etc. The Secretary is authorized to give preference to application for leases for the development of electrical power by States, counties or municipalities.

H. R. 418, by Mr. Bailey, authorizes the President of the United States to employ officers and men of Army and Navy in railway and other Government construction work, which includes the reclamation of arid lands, the drainage of submerged or swamp lands, the construction of levees, the laying out and building of highways, and the improvement of rivers and harbors. It also provides that civilians shall not be employed in any such work authorized by Congress unless military and naval establishments can no longer supply officers and men necessary to carry on the work with reasonable expedition.

H. R. 671, by Mr. Auston. Provision is made in this bill for the application of a portion of the proceeds of the sales of public lands to the endowment of schools or departments of mines and mining. (Substantially the same as S. 50, by Mr. Smoot.)

H. R. 6043, by Mr. Raker. This bill is the same as introduced by Congressman Taylor, H. R. 18.

H. R. 6780, by Mr. Kahn. All public lands of the United States containing valuable deposits of asbestos are declared to be subject to location, and entry under placer mining laws by this bill, and locations heretofore made under placer mining laws of lands containing such deposits, may be perfected. If the lands heretofore located were located under laws applicable to lode-mining claims, they may be perfected under the provisions of such laws.

NEVADA'S 1915 METAL OUTPUT IS VALUED AT $34,566,000

The United States Geological Survey reports the value of the 1915 output of gold, silver, copper, lead, and zinc from Nevada mines as approximately $34,566,000. This represents an increase of nearly 18 per cent over the output of 1914, when metals valued at $29,300,842 were produced. These estimates, by V. C. Heikes, of the Salt Lake City office of the Survey, indicate a marked increase in zinc output, and increase in lead and copper yield, as compared with 1914. The copper production, however, was below that of 1913, when Nevada had a record output of over 90,000,000 pounds. There was a slight increase in the gold production, but a decrease in silver, largely in the Tonopah district, where the output was affected by the decreased price of silver.

The production of gold was valued at about $11,968,000, an increase of 4 per cent over the production of 1914. The greater part of the gold came from siliceous ores milled, and about 20 per cent of the total came from Tonopah. The Goldfield Consolidated treated over 386,000 tons of ore, but produced somewhat less gold than in 1914. Other mines in the district, however, went to make up this deficiency, for important tonnages came from the Jumbo Extension, which was shipping about 1,500 tons per month the early part of the year and subsequently nearly doubled this output. The Atlanta and Florence Goldfield also shipped considerable gold ore. Goldfield district produced approximately 40 per cent of the total gold of the State. The Nevada Wonder and Nevada Hills properties in Churchill County contributed, though less than in 1914. The output from Round Mountain, in Nye County, was also somewhat less, due to the installation of a pipe line for placer operations. There was a great increase, however, in the Seven Troughs district, where the Seven Troughs Coalition has added considerably to the gold production. The National mine, in Humboldt County, increased its output, but nothing was published concerning the property. Though the plant of the Aurora mine was closed part of the year for alterations to the mill, the bullion shipments were far in advance of those in 1914. The Pittsburgh Silver Peak Company, at Blair, Nev., was treating nearly 4,000 tons of ore per month, and the mines at Rochester produced shipping ore and bullion which contained some gold, though principally silver. The output of gold from the Tonopah district decreased from 128,137.32 ounces in 1914 to about 113,000 ounces in 1915, giving a production of over $2,335,000 in gold, though the district is primarily a silver camp. In Clark County, at the Quartette property, ore was treated at the Cyrus Noble mill as formerly, and a new cyanide plant was reported operating at the Colorado Nevada mine. In Elko County the Bluster mill, at Jarbridge, and the Rex mill, at Gold Circle, were active. There was much activity at the new camp of Willard, 9 miles northeast of Lovelock. Various lessees were shipping gold ore. In the Manhattan district of Nye County the Big Pine mine was the principal producer, the mill of which was treating 150 tons per day by amalgamation the latter part of the year. Four other mills were operated to smaller extent in the district—the Whitman & Kane, Manhattan Milling and Ore Company, the Associated Mill, and the War Eagle Mill.

SILVER PRODUCTION DECREASES

The silver production from Nevada mines decreased from 15,455,491 ounces in 1914 to about 14,478,000 ounces in 1915. The decrease was at Tonopah, where the mines were affected by the low price of silver. At the Comstock district of Storey County the production was also decreased, and the idleness of the Mason Valley copper smelter, to a small extent, lessened the silver output. The greatest silver producers in the State were the Tonopah Belmont, Tonopah Mining Company, Tonopah Extension, Jim Butler, and West End, at Tonopah; Nevada Wonder and Nevada Hills, in Churchill County, and the Rochester district, in Humboldt County. The mines in the last-named district were active, but particularly so after the advent of the Nevada Short Line Railroad. The 100-ton cyanide custom mill was operated, producing gold and silver bullion, and a small mill was active on the Lincoln Hill property. There was considerable activity in the Rand district of Mineral County, where unusually rich ore was shipped from the Last Hope, Gold Pen, Queen Regent, and Eagle properties. In the old camp of Belmont, in Nye County, a 200-ton mill, using flotation, was being constructed to treat dump ore containing silver.

The mine production of copper increased from 60,986,450 pounds in 1914 to about 67,480,000 pounds in 1915, an increase of 10.6 per cent. The total value of the output, on account of the high average price in 1915, increased from $8,111,198 to approximately $11,708,000. As the Mason Valley smelter was idle during the year, the greater part of the output came from White Pine County, where the Nevada Consolidated was particularly active toward the end of the year on account of the price of copper, which increased to nearly 20 cents a pound. During the first three quarters of the year 2,251,367 tons of ore were milled from this property and over 44,000,000 pounds of copper produced. The rate for the last quarter was greatly increased. Ore from the Giroux was also milled and smelted at the Navada Consolidated plant. Copper ore was also shipped from the Goldfield district. Ore was shipped from the Nevada Douglas the latter part of the year and a 250-ton leaching plant completed for the treatment of low-grade ore.

GAIN IN LEAD YIELD

The lead production of Nevada mines increased from 12,809,655 pounds in 1914 to about 14,782,000 pounds in 1915, an increase of over 15 per cent. This output, however, is not as great as that of 1913, when over 16,000,000 pounds were produced. There was great activity in the Yellow Pine district of Clark County, where lead-zinc ore is separated into lead and zinc products. Several dry concentrating mills were added during the year. A large portion of the output came from Lincoln County, where the Prince Consolidated was reported shipping at the rate of 12,000 tons per month in October.

A great increase, nearly 62 per cent, was made in the mine output of zinc in Nevada, from 12,980,232 pounds of recoverable spelter in 1914 to over 21,000,000 pounds of the metal in 1915. As the price of the metal was abnormally high in 1915, the value of the output increased from $661,992 to about $2,993,000 in 1915. The Yellow Pine district of Clark County was by far the largest producer, but the Amalgamated Pioche property in Lincoln County made important shipments, and the Polar Star property and Arthur zinc mine, both in Elko County, contributed. Small shipments of zinc ore were also made from Ely in White Pine County and from Mineral in Eureka County. The latter part of the year the Yellow Pine mine had increased its shipments to the rate of 1,500 tons per month, the Potosi property to about 800 tons per month, and there was great activity in the other zinc properties in the district. The Green Monster was an important shipper at the close of the year.

The main dividend payers of the State were Nevada Consolidated, Goldfield Consolidated, Tonopah Mining, Tonopah Belmont, Tonopah Extension, Jumbo Extension, Jim Butler, Nevada Wonder, Seven Troughs Coalition, and West End. To December 1, 1915, the total in dividends was over $6,000,000.

NO METALLIC ARSENIC PRODUCED IN THIS COUNTRY

So far as the Geological Survey knows no one in the United States produces metallic arsenic. The whole United States production is in the form of the so-called white arsenic.

The only source of arsenopyrite from which the material could probably be shipped at once is that at Brinton, Va. It is known that the arsenic company at that place has had a considerable quantity of arsenopyrite mined ready to be worked for several years. C. R. Brinton, Brinton, Floyd County, Va., is interested in the deposit which is fourteen miles from the railroad at Christiansburg.

NITRATE WIDELY DISTRIBUTED BUT DEPOSITS ARE LEAN

Opportunity for Development on Commercial Scale Not Promising, Government Expert Says

Nitrate deposits in southern Idaho and eastern Oregon are discussed extensively in a report by G. R. Mansfield, of the Geological Survey. The report has just been printed and is now ready for distribution. Interesting extracts from this report are as follows:

"The nitrate deposits near Homedale, Idaho, appear to have been first discovered in the spring of 1914 by D. J. Sullivan, of Homedale, who, according to his own account, recognized their occurrence in the canyon of Jump Creek about 10 miles south of Homedale in proximity to an old metalliferous prospect just below the falls of that creek. Only a small quantity of the material was found, 'enough to fill two flour sacks,' but a strip of brown paper dipped in a solution of the substance and then dried and burned indicated by its sputtering scintillations the presence of a nitrate.

"About the same time the young sons of George D. Huntley, whose ranch lies in the canyon of Sucker Creek about 10 miles west of the Jump Creek locality, were playing in a small cave at the base of a cliff in the canyon about half a mile below their home. Having started a fire in the cave, they were surprised to find that some of the white material at the back of the cave and in the crevices of the rock took fire and burned vigorously. This incident, together with the discovery by a camping party of a white deposit at several localities on Sucker Creek, was reported to Mr. Sullivan, who visited the place and again recognized the presence of a nitrate in the deposits. Meanwhile a prospector named Lacky who had passed through Sucker Canyon had collected a sample of the white material and had shown it to persons in Ontario, Ore., among whom chanced to be Henry Wilson, a California mining engineer, who recognized the presence of a nitrate in the sample.

"Mr Sullivan and his associates staked out claims, and shortly afterward interested persons from Ontario made extended examination of the district and rapidly staked out a large area, so that considerable local excitement ensued.

"The occurrences of the nitrates above mentioned are all associated with rhyolites. Nitrate deposits in rhyolites occur at several places in Nevada and Utah. The rhyolites seem to be widely distributed and to carry niter in many places, though niter is by no means confined to rhyolitic rocks. The Homedale district is therefore probably only a part of a much larger niter-bearing area, in which locally, as at Sucker Creek, the niter occurs in notable amounts.

"The little veinlets that contain the nitrate form only a small part of the whole mass in the zones where the nitrates occur—probably not more than 1 per cent.—and the same veinlets carry other substances than nitrates, as is shown by the analyses. When the rock fragments are picked down from the cliff face at any of the prospects described, fresh veinlets are exposed, similar in character, number, and thickness to those previously found. How far into the rock this condition continues it is impossible to say from present data, as none of the prospects have penetrated more than 3 or 4 feet from the cliff face. The present evidence does not preclude the possibility of finding an increase in the size and number of the nitrate-bearing veinlets, or perhaps even large veins, when the rock is opened further. There seems, however, little likelihood of any marked increase in richness within the interior of the rock mass. On the contrary, it appears more probable that the richest parts of the deposit are those already exposed in the faces and along the bases of the cliffs and that the material will be found to grow gradually leaner and perhaps to disappear altogether as the rock is penetrated. Whatever may have been the mode of origin of the material, it probably owes its present position to the action of percolating waters on the one hand and to evaporation on the other. On that supposition the concentration of the deposit would naturally be greatest at or near the surface, where evaporation takes place. However, no positive statement can be made until more work has been done in opening the veinlet-bearing zones, both laterally and vertically."

For Safety's Sake, Blast With
LOW FREEZING
DU PONT
EXPLOSIVES
Especially Made for Blasting Work in Winter Weather

NOW is the time when the blasting crews experience trouble with explosives affected by chilling temperatures.
Insist that all blasting shall be done with our LOW FREEZING EXPLOSIVES. They remain un-frozen and retain their efficiency in near zero weather. *Thawing is seldom necessary.* TELL US ABOUT YOUR WORK. LET US HELP YOUR CREW TO GET BETTER RESULTS. WRITE TO DEPARTMENT 234

E. I. du Pont de Nemours & Co.
Powder Makers Since 1802
WILMINGTON, DELAWARE

PERSONALS

F. F. Sharpless, Secretary of the Mining and Metallurgical Society of America, was a caller at the office of the Mining Congress last month.

H. V. Winchell, of Minneapolis, Minn., was in Washington last month, attending the Mineral Land Law Revision meeting, and was a caller at the office of the Mining Congress.

John P. Reese, of Gillispe, Ill., spent several days in Washington last month.

Nat H. Wheeler, of Philadelphia, Pa., one of the representatives of the American Mining Congress to the meeting of the Mining and Metallurgical Society of America, held last month, spent several days in Washington.

Carl Scholz, President of the American Mining Congress, was in Washington several days last month.

C. M. Moderwell, of C. M. Moderwell & Co., Chicago, director of the American Mining Congress, was a Washington visitor last month.

Hugh Shirkie and J. C. Kolsem, of Terre Haute, Ind., spent several days in Washington last month, attending the meetings of mining men here at that time.

Walter Douglas, of Bisbee, Ariz., was a visitor at the office of the Mining Congress last month, and also attended the meeting of the Mining and Metallurgical Society for the Revision of Mineral Land Laws.

F. W. De Wolf, State Geologist, Urbana, Ill., was a caller at the office of the Mining Congress last month.

Dr. E. W. Parker, of Wilkes-Barre, Pa., spent several days in Washington last month attending the various meetings of mining men held at that time.

Dr. James E. Talmage, Salt Lake City, Utah, director of the American Mining Congress, is in Washington attending the Second Pan-American Scientific Congress, now in progress.

Hon. William A. Clark, Butte, Mont., was in Washington last month attending the Mineral Land Law Revision meeting.

Harold N. Lawrie, Portland, Oreg., was in Washington several days last month.

THE
MINING CONGRESS
JOURNAL

SAFETY–EFFICIENCY–CONSERVATION

VOL. II

No. 2

FEBRUARY, 1916.

Photograph by N. H. Darton.

DEVIL'S TOWER, WYOMING
A geological phenomenon.

LIBRARY
FEB 16 1916
UNIVERSITY

PUBLISHED BY
THE AMERICAN MINING CONGRESS
PUBLICATION OFFICE
MUNSEY BUILDING WASHINGTON, D. C

WILMOT ENGINEERING CO.

Works, White Haven, Penna.
HAZLETON, PENNA.

MANUFACTURERS OF

HIGH GRADE MACHINERY

FOR THE PREPARATION AND HANDLING OF

ANTHRACITE COAL

WILMOT RIVETLESS CHAINS for Conveyors for Elevators for Car Hauls

LLOYD COMPOUND (HOLLOW GROUND TOOTH) **ROLLS**

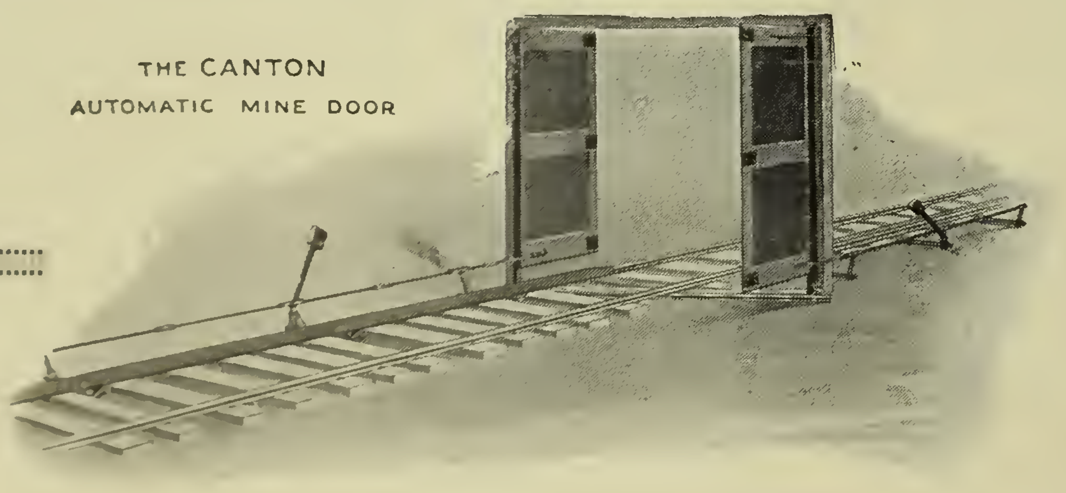
PARRISH Flexible Arm **SHAKERS**

SIMPLEX JIGS

handling
crushing
screening
cleaning

BEST SERVICE—LONGEST LIFE—LOWEST COST OF UP-KEEP

Let us figure with you on your new installation or replacing your old and obsolete ones



IMPROVED METHODS

Without Additional Expense

IF you contend for old time methods, you might try keeping time by employing a boy with a hammer and gong, to strike off the hours as indicated by a sun dial. ¶ A trial, however, will convince you that a good clock is cheaper and more reliable. ¶ So is the Canton Automatic Mine Door better than a trapper boy. ¶ Write for literature.

THE AMERICAN MINE DOOR COMPANY, Canton, Ohio

To the Members of the American Mining Congress:

Do you know that you are the owners and publishers of the MINING CONGRESS JOURNAL? We trust you will realize the responsibility of this ownership and that you will lend your active assistance in making the Journal a greater success.

Real mining men should be active members. An application blank will be found on another page of this issue.

Associate memberships are designed for those not actively interested in mining, but who are willing to assist a state Chapter of the Mining Congress in helping to develop the Mining industry within the State. All memberships include subscription to the MINING CONGRESS JOURNAL.

Every member of the Mining Congress should undertake to send in at least one application each month. Will you help by having the following blank filled in and mail to this office?

SUBSCRIPTION AND APPLICATION FOR ASSOCIATE MEMBERSHIP IN THE

AMERICAN MINING CONGRESS

....191.......

I hereby make application for Associate Membership in THE AMERICAN MINING CONGRESS, and agree, if accepted, to abide by the By-Laws, Rules and Regulations of said organization and to pay the dues required by same. Herewith find $1.00 fee and $2.00 dues for one year, including subscription to the Mining Congress Journal ($1.00 of which is designated as subscription to Journal)

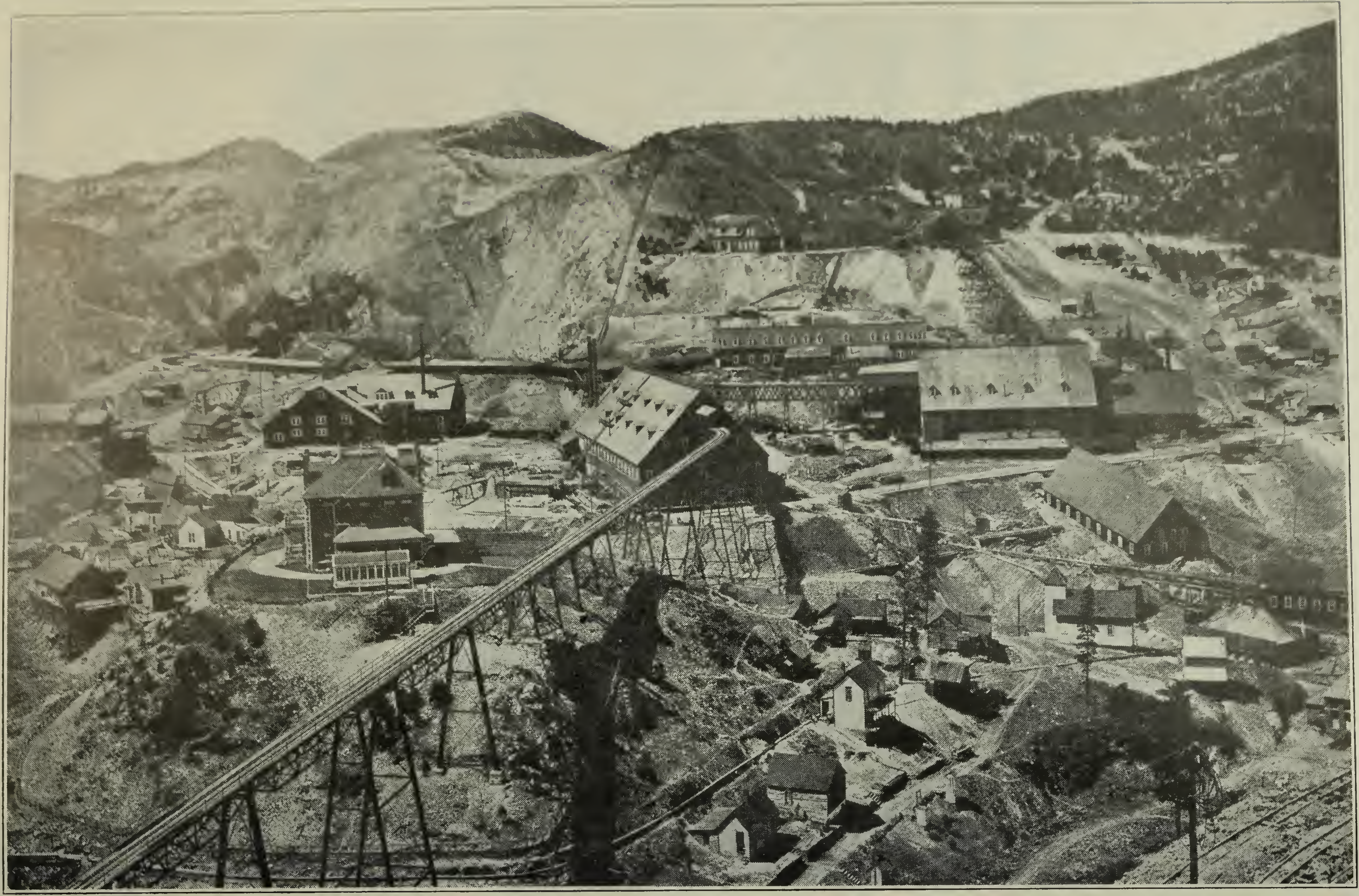
Name..

Occupation..

P. O. Address..

....

Recommended by..



THE GREAT HOMESTAKE MINE, LEAD, S. DAK.

VOL. 2, NO. 2 WASHINGTON FEBRUARY, 1916

THE MINING CONGRESS JOURNAL

Official Organ of the American Mining Congress

MINES AND MINING COMMITTEE PIGEONHOLES SMOOT AND TAYLOR BILLS

Long Fight for Investigation before Attempting to Revise Mining Laws Defeated by Action of House Committee—Subcommittee Will Draft Bill Providing Changes in Law—May Be Presented at This Session

By a vote of seven to six the House Committee on Mines and Mining, January 24, blocked the attempt to secure a commission for the purpose of investigating what revision of the mining laws the West desires. The committee decided to name a subcommittee which will frame a bill without the services of a commission. It is expected this bill will be ready for presentation at this session of Congress.

The action of the committee means that the Smoot bill, which had passed the Senate, will die in the pigeonhole of the House committee and that the Taylor bill, intended to accomplish the same end, will have no chance to get before the House.

Representative Taylor, of the Committee on Mines and Mining, commented as follows on the action of the committee:

"I am very much disappointed at the action of the Mines and Mining Committee in voting seven to six to decline to pass my bill or Senator Smoot's bill for the appointment of a commission. I do not feel that the action of the committee in authorizing the appointment of a subcommittee of five to draft a codification of the mining laws will be either effective or satisfactory. Such action is not what the mining interests of the West want or what they had a right to expect.

"Of course this unfortunate situation comes entirely from the fact that of all the membership of the Mines and Mining Committee of the House I am the only one who lives west of the Mississippi River. The other members know little or nothing about metal-mining conditions in the West and neither they nor their constituents have any personal or direct interest in the matter. They are not to blame. The committee has jurisdiction over coal mining and all members of the committee have coal-mining interests in their districts. As a result their direct interest and concern on that committee pertain to coal mining.

"I have no idea that the subcommittee will visit the West or take any systematic action to make an investigation of conditions that need remedial legislation. I doubt if it will be of any important service. However, if the committee will take up the work and give the investigation the necessary time, which I do not believe it can do, it may be able to make some piecemeal recommendations for amendment to the mining laws that may be of some service. While I hope that this may be the case I do not expect anything of the kind.

"I cannot resist a feeling of serious disappointment and regret that a great committee should take this action in direct defiance and utter disregard of an earnest and unanimous appeal of every Representative and Senator in Congress from the sixteen Western States, supported as they were by the positive endorsement and recommendation of the Secretary of the Interior and of the Bureau of Mines.

"I cannot see any justification for the utter disregard of the wishes of the people of the western half of the United States when they are united on a subject and when the expense involved is so trivial as the amount asked to make possible intelligent legislation."

Chairman Foster, of the committee, who was among those who opposed the appointment of a commission, said:

"I believe that there should be changes in the mining law. There were only three changes advocated in all the hearings that we just have completed. I do not believe the situation is one that cannot be handled intelligently by the subcommittee asked by the men in Congress from the Western States. Judge J. W. Thompson, chief of the legal section of the Bureau of

Mines, is a very able man and particularly qualified to give assistance in this work. We are assured of his cooperation. In this way we hope to be able to meet all demands for revision and to get the legislation on the statute books at this session of Congress."

Senator Smoot and Representative Taylor lay no small portion of the blame for the action taken with regard to their bills on the shoulders of James Wickersham, the delegate from Alaska. Judge Wickersham declares that he simply presented his side of the case to the committee as did Senator Smoot and Representative Taylor. His conclusion is that the committee must have considered that his presentation of the case was more meritorious.

Due to the fact that most of the members of the committee have only a general idea of the needs of the mining industry with regard to a revision of laws, it was necessary to spend a great deal of time in discussing the history and rudiments of the question. This was done very ably by a number of those who spoke.

SENATOR WALSH APPEARS

Senator Walsh was on the stand during the first day's hearing. Some of his declarations were in substance as follows:

Great as is the need for revision of the laws governing metal mining it is nothing like as necessary as is the case with the non-metalliferous deposits. A commission of three can do the work as well as five. A well-contested mining law suit well may cost $500,000. The abolishing of the apex law has been necessary in every country which has made use of such a regulation. The American Mining Congress, the American Institute of Mining Engineers and the Mining and Metallurgical Society of America, the three national organizations, have gone on record in favor of a complete revision of the mining laws. The development of dry farming is resulting in more strifes than ever between the miner and the homesteader. The public mind, in the mining states, has not yet centered on just what ought to be done in regard to revising the laws.

The old-time prospector is opposed to any change. The commission should see them as well as all others interested, directly or indirectly, in the industry. New laws are needed badly by the coal mines of the West. The urgency of action with regard to non-metallic deposits is such that they should not have to wait the action of a commission. There is great need for the development of the phosphate deposits in the West. The capital to invest in this industry is ready; all it needs is the attention of Congress.

In reply to a question by Chairman Foster, Senator Walsh declared it to be his opinion that it would be impossible to get a commission from Congress which could give the time to the work that would be necessary. He also cautioned against allowing the Bureau of Mines and the Geological Survey in taking a guiding position with regard to the revision of mining laws. He called attention to the fact that the present position of the Government with regard to mineral lands would make it very desirable for no Government expert to be on the committee.

MR. CALLBREATH SPEAKS

James F. Callbreath, Secretary of the American Mining Congress, went extensively into the needs of revision of the mining laws. He concluded his forty-minute talk before the committee by saying:

"A few years ago it was thought, after all of the incentives which make possible the investment of private capital in the construction of transportation facilities in the new countries had been taken away by the withdrawal order, and railroad construction, or the greater part of it, which had been undertaken had been stopped at that time, the people of the country felt that something should be done to open up Alaska. Someone evolved the idea of government construction of a railroad, and a commission was appointed. Now this nation is pretty well confirmed in its opinion as to the advisability of the government construction of railroads, but notwithstanding that fact a commission went out to Alaska, came back and made a report and within four or five years from the inception of that idea, and acting to a large extent upon suggestions of that commission, a bill appropriating $35,000,000 was enacted by the Congress, and the railroad is now in the process of construction. In the one instance we were 30 years trying to frame a law to meet conditions which the whole nation agreed should be met in a liberal, broad way, and in another instance, through a commission, in four or five years we have appropriated $35,000,000 to do a thing upon which public opinion is very evenly divided. So I say in this instance the railway commission going to Alaska was effective in reaching results, while in the matter of opening up Alaskan coal without a commission, coming out to advise Congress as to what the conditions were, we have absolutely failed in getting results.

"The question is only one of practicability. We want results and our organization, after a number of years of investigation of this subject through a very able committee, devised this plan of reaching it.

"Mr. Walsh told you of the apex law, and the bad things growing out of that apex law. There are many men who do not believe the apex law should be abolished. They say that the apex law having been in effect all these years, and the courts having built up a system which the people now understand, it is better to leave it alone now no matter how advisable it would have been originally to create different regulations. So if you undertake to frame a law simply abolishing the apex law, you will find a lot of opposition to it. Upon the other hand, if a commission shall go out and investigate all those conditions and come back and say that it is the consensus of the opinion of men engaged in the practical workings of this industry, I believe you have then got something on which you can base intelligent action. I am not particular whether the commission shall be paid or whether it shal not be paid. I am not particular who shall compose the commission, except this, I do feel that a man who knows the practical ends of mining should be upon that commission. We need the professional man; but we also need the man who understands the practical conditions which are to be considered. What I desire is simply an effective commission, with or without pay, but with that dignity which will enable it to come back to you and command your respect."

SENATOR THOMAS SPEAKS

Senator Thomas is of the opinion that the laws should be thoroughly revised or let alone. In his talk to the committee he placed greatest emphasis on the law of the apex, but also called attention that other features of the mining law are in as serious need of revision. He characterizes the law of the apex as causing more needless litigation than any other statute ever enacted. Fifty per cent of this litigation, Senator Thomas declares, is unnecessary. The law, he said, is less understood now than it was forty-four years ago. He described it as being bewildering and confounding and that decisions made by different courts, with regard to cases which arise under the law, are absolutely unreconcilable. Every new decision, he says, simply tends to befog the law more. He called attention to the fact that the United States is the only country in the world in which this law exists. The fact that it is not applied in Michigan is the reason for Michigan's having one case of litigation to each 100 in the West. He referred to the Canadian and Mexican codes as being very much superior to the American mining laws. He pointed out that some of those who would see the law continued as at present are those who thrive on the litigation which it causes.

ENORMOUS WASTE

Twenty-five per cent of the entire output of the mines of the West have been absorbed in litigation, Senator Thomas said. He is of the opinion that it is not absolutely necessary to have a commission as there are many men in each House of Congress who are familiar with mining and its needs. He also suggested that such eminent scientific men as Horace Winchell and John W. Finch and many others of equal ability would be very glad indeed to lend any assistance within their power toward accomplishing an intelligent revision of the present mining code Referring, however, to statements that Congress is tiring of commissions, Senator Thomas held that generally speaking, commissions are very useful and one probably would be very helpful in furnishing data on which to base intelligent revision of the mining laws.

The principal objections to a congressional committee of investigation is not that men of sufficient ability could not be secured in Congress, but that Representatives and Senators have not time to spend a year working on one question. Mr. Taylor suggested that if they did some one else would be occupying their seat in Congress when they returned.

During the hearing frequent mention was made of the meeting held in Washington, December 16, by the national mining organizations. Mr. Ingalls, in addressing the committee, called attention to the fact that this meeting was not of any one organization, but was a meeting in which the three national mining organizations cooperated. Mr. Ingalls' talk to the committee was devoted largely to a presentment of reasons as to why the laws should not be revised piecemeal. He declared that there is no one in the mining industry at the present time who could revise intelligently the mining code. Despite all of the efforts that have been made to ascertain just what would be best for the entire industry, the facilities for proper investigations never have been enjoyed and as a result there is still much difference of opinion as to what a revised code should provide, he said.

REVIEWS WORK DONE

Mr. Ingalls reviewed the history of the attempt to revise the mining law. He told of the efforts of many years by the American Mining Congress and of the American Mining Congress Committee of which he was a member. It was very plain for the committee to judge, from his remarks, as to the unselfish efforts that have been made by mining men themselves, in an effort to ascertain the revision that is necessary. They have expended considerable sums of money and large periods of their valuable time in endeavoring to coordinate opinion in this regard. Dr. Ingalls expressed the opinion that after all of this work, that there is still great difference of opinion, that the only means by which an absolute knowledge of what is necessary is a commission with the prestige that would come to envoys of the Federal Government, who could get first-hand information from all classes affected.

An extract from Mr. Ingalls' remarks is as follows: "A number of years ago a resolution was introduced at a meeting of the American Mining Congress, of which Mr. Callbreath is secretary, appointing a committee to consider rules and regulations for metal mining with the view to increasing safety in operation. We were perfectly aware that that was a problem that concerned the States, not the National Government, but the idea that we had was that if we should prepare a form of carefully digested legislation the several States would use that as a model for legislation. The committee that was appointed to consider this matter consisted of myself as chairman, Mr. Channing, Mr. Finlay, John Hays Hammond, and Dr. Douglas. As we proceeded with the work we found wide differences of opinion regarding these matters. One district had certain conditions, another district had other conditions. Some people thought that certain things ought to be, while others thought they ought not to be. We encountered many subjects about which nobody knew the right thing—in many cases nobody had thought about them at all—for the practice of mining had been steadily developing and in many directions had outstripped classified and coordinated knowledge. Our way of handling these conflicting opinions was to detail assistants to collect and study all possible evidence, to consult experts in special matters, and to publish our proceedings from time to time, circulating them among people all over the country, asking them what they thought about things. Finally, when the different ideas came before the committee they were discussed in debate and were settled by vote of the committee, and with few exceptions had been so developed by the previous studies that the vote of the committee was unanimous.

"Well, we were able to prepare a final product in that way that I think met with universal approval. Not long ago I happened to meet one of our chief critics in certain points—a man who thought during our early stages that we were writing wrong things into our proposed law—and I asked him what he thought of the final product. He replied that it had his unqualified approval; that the committee had met all of his objections and had disarmed his criticisms. That is the kind of feeling that we want to have toward a revision of the Federal law governing mining titles.

"Now it seems to me that in order to have the right kind of legislation in a matter of this kind the start has got to be made in something like the way that I have described. Bearing further on this idea let me offer another bit of evidence. This committee on rules and regulations for mining, that I have mentioned, from time to time published interim reports. One of those interim reports containing a proposed draft for a bill was practically written into the laws of the State of Arizona. A few days ago my attention was called to a paper on recent legislation affecting the mining industry by Mr. Walter Douglas, of Bisbee, Ariz., Mr. Walter Douglas being general manager of Phelps, Dodge & Co., the largest mining company in that State, and one of the largest mining companies in the Union.

"Mr. Douglas made these remarks:

> It has been singularly fortunate for the State of Arizona that some time prior to the convening of its first legislature the American Mining Congress had appointed a committee of distinguished members to compile a code applicable to the conditions obtaining in metal mines and that the rough draft of its report was available for the legislature when confronted with the necessity of framing a law as directed by the constitution.
>
> With a few minor and one major exception, the code drafted by that committee was adopted and became the present law under which mines are operated in this State. It is a pleasure to be able to say that State inspection—

"That was something that this code specially provided for—

> instead of being a detriment or an embarrassment in operating, has become a positive benefit, in that it has kept the management in close touch with underground conditions through the state inspector and has assisted those in direct charge by association with an outside point of view. Perhaps part of the success has been largely due to the ability, tact, and helpfulness of the mine inspector, who has converted prejudice and suspicion into hearty cooperation.
>
> In conclusion, therefore, it is a fair assumption, which is borne out by actual experience, that ill-digested legislation, such as that above cited, has not been of financial or moral benefit to the wage earner, but has served to embarrass an industry on the material prosperity of which this State to a large extent depends.

"Mr. Douglas is here referring to workmen's compensation legislation.

> Emphasizing thus the contrast between the carefully considered mine inspection law and the hastily framed and illogical compulsory compensation and eight-hour [illegible]

"That is exactly what we want you to do. We want you to defer to the unanimous demand of the mining industry that the mining law be revised in a carefully considered way; that you will give us carefully considered legislation, not hastily framed and illogical and poor legislation."

CHANNING SHOWS MAPS

J. Parke Channing displayed to the committee maps and blue prints showing the differences in the application of Canadian and American mining laws. He compared a map of a Canadian camp and a map of the mining district around Butte, Mont. He pointed out the advantages in the Canadian system. He called attention to the fact that Rhodesia, in South Africa, is the only mining area in which the apex law applies outside of the United States. He stated, however, that Rhodesia is very anxious to rid itself of the apex law.

Mr. Channing is of the opinion that mining men throughout the country are agreed on the cardinal features which should be covered by revision. He said that the present law discourages prospecting and on account of this has a serious influence on the whole industry. He was the only speaker appearing before the committee to bring out the feature that the decrease in the amount of prospecting is bound to be reflected in increasing amount in the progress of the industry. Mr. Channing advocated a commission which should visit Alaska as well as parts of the United States. He thinks the commission should consist of five salaried men. He is not impressed with the necessity of having lawyers on the commission, as he considers that legal talent can be called in for framing the law.

A YEAR NEEDED

Following Mr. Channing, J. R. Finlay, a mining engineer of New York, appeared before the committee. Mr. Finlay, who had charge of the appraisement of mining lands in Michigan for the State tax commission, made estimates of the expense that would be necessary to feel the public pulse in regard to revision of mining laws and as to the time that would be consumed. He thinks that a year of concentrated and systematic effort should be sufficient to have the matter in good shape. It is his opinion that the commission would have to spend six months in taking testimony and six months in adjusting their facts after their return. He thinks it would be difficult to get a proper commission without remunerating the members.

WICKERSHAM SPEAKS

Judge Wickersham opposed the commission strenuously. He alleged that Mr. Ingalls, Channing and others are too closely connected with the copper trust to be above the suspicion of having ulterior purposes in wanting the mining laws revised. Extracts from his remarks follow:

This question of litigation is not such a serious matter as it used to be. So many great questions have been settled in the courts that it requires a mining expert now to evolve new questions,

(Continued on page 87)

MANNING TELLS UNITED MINE WORKERS HOW THEY CAN HELP REDUCE LIFE LOSS

Head of Bureau of Mines Addresses Miners' Convention at Indianapolis—Makes Plea for Cooperation in Bringing Greater Safety to Those Who Work Underground

PRINCIPAL POINTS IN MANNING'S ADDRESS

1

Pledges best efforts to reduce loss of life in mines.

2

Estimates loss of life in mines in 1915 at 2,200. Gives other important unpublished figures.

3

Points out why miners must have respect for the scientific as well as the practical.

4

Sees in workmen's compensation a great instrument of good.

5

Tells how the number of mine accidents may be reduced to the minimum.

Addressing the United Mine Workers of America in Indianapolis, January 26, Van H. Manning, Director of the United States Bureau of Mines said, in part:

I am here to give you my pledge of the very best there is in me to the cause of reducing the number of deaths in the mines. All I ask is that you continue the cooperation you gave Dr. Holmes, as I know you will. You perhaps realize, better than many others, the futility of trying all alone to accomplish something worth while. You know that in union there is strength; the achievements of your great organization bespeak that knowledge. In the same way, the Bureau of Mines needs your cooperation, needs the cooperation of the operators, needs the cooperation of the state mine inspectors. That it has had all this cooperation is shown in the improvement that has already been made. The results, I am happy to state, are now beginning to show in a substantial manner in decreases in the number of lives lost in coal mining.

LATEST FIGURES

While I do not as yet have the complete fatality figures for the year just closed, I have every reason to believe that they will show the smallest number killed in any year since 1907, and the lowest death rate for every 1,000 men employed since 1900. The improvement during the last three years, I might say, has been remarkable. We have already collected the figures for eleven months of 1915, and from what we know of December the indications are that the deaths for the entire year will number about 2,200. Compare this with 2,785 deaths in 1913 and 2,451 in 1914.

In all mining in the United States, coal mining, metal mining and quarrying, the total number of deaths in 1913 was 3,651. In the year 1914 this was reduced to 3,193, showing a saving of 458 men to their wives and families in 1914. This improvement is quite marked in the death rates. In 1913 there were three and a half men killed in every 1,000 men employed. In 1914 this had been reduced to slightly less than three and one-sixth men in every 1,000 employed. Putting these figures more plainly, in more than a million men employed in all mines and quarries, one man was saved in every 3,000 employed in 1914. With the rather good showing of the coal mines in 1915, we expect that the total death rate for all mining for the year will be considerably reduced over the year 1914.

USE OF THE CANARY

Mining is a blending of the scientific with the practical. The practical miner knows by experience the deadly danger of the gases found in the mines, but it takes the chemist with his delicate instruments and his trained, expert knowledge to find out some things about gases, vital to the welfare of the miner, that the miner never has the opportunity to learn in the pursuit of his daily task. An extreme illustration of this is the use of the canary bird as detectors for detecting poisonous gases. The bureau uses these birds to insure the safety of volunteer rescuers who may have pressed far into an explosion-wrecked mine in the hope of helping out any miners who have survived. As long as the canary is able to sit upon his perch, the volunteer party is entirely safe as to poisonous gases. If the canary bird falls, it serves as a warning and the rescue party generally has time to retreat to a place of safety, for a man may live for many more minutes in a gas-filled atmosphere than a canary. Until the bureau made experiments with these birds the miner had no way of knowing whether or not the canary would be practical for this purpose. That is one of the scientific things that we ask him to take for granted, as we have had the opportunity and we have tested the bird's ability along this line until we do know what he can do.

We feel that it is a part of our duty to solve those problems that the laboratory only can solve and give out the conclusions in the hope that here and there we may be able to save the life of some man who might be a victim of his own inability to know.

At Hanna, Wyo., several years ago, before we began our modest efforts to try to save life, forty brave men who hurried into a mine to save sixteen who had been entombed by an explosion might not have lost their lives had they known about the efficiency of the canary bird, for those men rushed into a deadly atmosphere of poisonous gas.

AS TO RESPONSIBILITY

The coal mines recruit a large new army of foreign workmen each year in order to keep pace with the rapidly expanding business. These men have perhaps never been in a mine before and it is all wondrously strange and intricate to them. Many of them have come from countries that do not have much coal mining, and most of them come from the sunny fields of agriculture of Europe. What they need, and before an accident happens, is careful instruction concerning safety rules and principles as related to mining. A careless management and new men unfamiliar with coal mining are the best combination I know to bring upon disaster.

In the education of these men to be miners, I know of no organization that could accomplish more practical good than the United Mine Workers of America. There is no better way than the frequent meetings of groups of miners as seen in your many locals in almost every mining camp in the country. You not only can discuss the problems that are peculiar to your own mining camp, the problems that arise from day to day, but you are brothers in a common danger and can give to each other that touch of human fellowship and sympathy that makes the lessons of wonderful value.

It is in this sort of work that the Bureau of Mines wishes to help you. It is for this reason that the Bureau, through the sanction of Congress, is printing the series of miners' circulars that tell about the dangers of mining and how they may be avoided.

A NEW DISPENSATION

Within the last few years there has come a new dispensation, a realization that each industry should bear its proportionate hazards and that the widow and the children shall be cared for without making them subjects of public charity. And while workmen's compensation laws do not come within the function of the Bureau of Mines, I do believe that our propaganda for "Safety First" has had a tremendous influence upon the passage of laws in many States that provide for the proper keeping of the widow and her children, and the care and compensation of the injured.

Today thirty-one States have workmen's compensation laws, the year just closed seeing new legislation in Alaska, Colorado, Indiana, Montana, Oklahoma, Pennsylvania, and Wyoming. One year ago a compensation law went into effect in West Virginia, one of the great coal-mining States of the Union, as you know. Imagine the great step forward in such a law as that. If a miner is killed the State pays not to exceed $75 funeral expenses; to the widow $20 a month and $5 additional for each child under age; to orphan child or children, $10 a month and so on. In West Virginia last year there was one accident that cost the lives of more than 100 men. Can you even estimate the amount of human suffering and human degradation that has been avoided in that one community by such a State law?

The greatest triumph for the miners in this direction, however, is in the State of Pennsylvania, the greatest coal-mining State in the entire world, employing an army of 364,000 miners, half of the total number in the United States. On January 1 of this year a workmen's compensation law went into effect in that State which I think will provide adequately for the widows and orphans and other dependents of miners who are killed in accidents and also for the miners themselves who may be either slightly injured or totally disabled.

It's a big step forward toward the principle of brotherhood of man—the principle we are all striving for.

PREVENTION OF ACCIDENTS

As a general statement, it may be said that there should be more stringent laws concerning the operation of mines; rigid rules and regulations on the part of the mining companies; a strict enforcement of the laws and regulations by State inspectors, operators and employees, with penalties for all who violate them, whether he be operator or employee. The education of the miner to realize the danger under which he works will have much to do with accident prevention. A common language, that is a language understood by both foreman and miner, is of prime importance. Improved safety methods and appliances will reduce the dangers incident to the industry. Among these may be mentioned the general use of safety lamps; the marking and guarding of all dangerous places, as shafts, winzes, chutes and other openings in the mines; a systematic inspection of all working places for gas, ventilation and roof conditions; safeguarding of machinery and electric wires; the employment of shot-firers, or, better yet, electrical firing apparatus, and shooting only when all men are out of the mine; the use of permissible explosives; the cooperation of State and Federal organizations with operators' associations, labor organizations, operators and employees; and, last but not least, eternal vigilance on the part of all.

Asks Resurvey

Senator Thomas, of Colorado, in behalf of the Silverton Commercial Club, has requested the United States Geological Survey to resurvey the Silverton quadrangle. This quadrangle contains 2,200 patented claims. This area is rapidly increasing in importance as it is the source of a considerable output of tungsten ore.

SIXTEEN NATIONAL ORGANIZATIONS FORM HOLMES SAFETY-FIRST ASSOCIATION

Hold Meeting in Washington Under Direction of Hennen Jennings and Discuss Plans for Perpetuating Memory of Man Who Started Safety First Movement

Representatives of sixteen national bodies interested in establishing a memorial to the late Dr. Joseph A. Holmes, met in Washington, January 15, and made plans for the establishment of a permanent memorial. The preliminary organization of the "Joseph A. Holmes Safety-First Association" was perfected.

In the meeting January 15, the following resolutions were adopted:

Whereas, It is the sense of this meeting that a suitable memorial be established to honor the memory of the distinguished humanitarian and scientist, Dr. Joseph A. Holmes, therefore be it

Resolved, First, that each national body or society here represented and others that desire to be represented be requested to approve a permanent organization or incorporation to be known and named "The Joseph A. Holmes Safety First Association," and that each such national body or society shall appoint one representative to act with other representatives in such permanent organization.

Resolved, Second, that a meeting be held of the duly appointed representatives at the Bureau of Mines building, Washington, D. C., on March 4, 1916, at which a permanent organization is to be effected.

Resolved, Third, that pending the formation of a permanent organization the temporary officers continue together with two members to be appointed by the chair as an executive committee with authority to incur necessary expenses, and that the temporary officers be authorized and empowered to take all necessary action in furtherance of the purposes of the permanent organization.

Resolved, Fourth, that the proposed organization when so effected shall through its various members and organizations endeavor to collect sufficient funds to carry out the purposes of this association.

Resolved, Fifth, that each national body or society becoming a member of this organization shall select its representative and notify the temporary secretary of such membership and selection.

Resolved, Sixth, that the temporary organization commends to the permanent organization the annual award of one or more medals which, together with honorariums, shall be termed "The Holmes Award" for the encouragement of those originating, developing, and installing the most efficient "safety first" devices, appliances or methods in the mineral industry and also special medals for the recognition of personal heroism or distinguished service in the mineral industry. However, further suggestions are invited from the organizations to be represented in this association.

The next meeting of the J. A. Holmes Safety First Association will be held March 4 at the Bureau of Mines. An executive committee, composed of temporary officers of the Association, has been formed, as follows:

Hennen Jennings, chairman, Van H. Manning, vice-chairman, George S. Rice, secretary. J. A. Finlay and Samuel Gompers are other members of the executive committee.

The following national bodies were represented at the meeting by the following:

The American Institute of Mining Engineers, Hennen Jennings and Van H. Manning; The American Mining Congress, Dr. David T. Day and Dr. Joseph Hyde Pratt; American Federation of Labor, Samuel Gompers; United Mine Workers of America, William Green; Mining and Metallurgical Society, Dr. George Otis Smith; American Society of Mechanical Engineers, Gen. W. H. Bixby; American Institute of Electrical Engineers, John H. Finney; American Electro-Chemical Society, Dr. F. G. Cottrell; National Safety Council, George S. Rice for H. M. Wilson; American Association for the Advancement of Science, Dr. L. O. Howard; American Chemical Society, Dr. S. S. Voorhees; Geological Society of America, Dr. Charles D. Walcott and Nelson H. Darton; National Academy of Sciences, David White; American Red Cross Society, Major Robert U. Patterson; American Forestry Association, William L. Hall; Natural Gas Association, Thomas C. Jones.

WICKERSHAM MAKING NOTABLE COLLECTION OF BOOKS ON ALASKA

James Wickersham, Delegate from Alaska, is making a collection of books dealing with the Territory. He already has collected 8,000 books and magazines.

It is his intention to turn over this collection when completed to some library or educational institution in Alaska.

The work of collecting books and keeping track of current publications of interest to Alaska, as well as the indexing of them, is in the hands of G. A. Jeffery, Mr. Wickersham's secretary, and Hugh A. Morrison, of the Library of Congress.

ORIGIN OF JOPLIN ZINC AND LEAD ORES DISCUSSED

Lead was discovered and mining begun in southwestern Missouri in 1848. Some zinc ores must have been found with the lead ores from the very first, but at that time they had no value as all the zinc smelters, were in the eastern part of the United States. In 1867 and 1869 zinc works were established at St. Louis and zinc mining became profitable. The production of zinc ores soon became equal to that of lead ores and has ever since been an active industry in that region and in the adjoining parts of Kansas and Oklahoma.

The region, generally known as the Joplin district, has been the subject of a number of geological investigations. Geologic surveys of the district were made by the State of Missouri in 1870, 1874, and 1894, and a survey of the Granby area was made in 1907. Surveys were made by Kansas in 1907 and by Oklahoma in 1912. The Federal Government surveyed the region in 1893, 1901, 1907, and a report on a survey of the Wyandotte quadrangle lying partly in the northeastern corner of Oklahoma and partly in Missouri is now in preparation by C. E. Siebenthal of the United States Geological Survey In studying the ore deposits of this area, Mr. Siebenthal reached certain conclusions regarding the genesis of the ores which are somewhat at variance with those reached by some other investigators but are in general confirmatory of the findings of the United States Geological Survey's earlier work.

In these investigations, the original source of the metals has generally been the subject of much speculation and study. Analysis of large quantities of material have shown the general presence of measurable quantities of lead, zinc, and copper in the pre-Cambrian crystalline rocks, in the Cambrian and Ordovician limestones, and in the Mississippian limestones, and it is also known that the Pennsylvania shale in a few places carries appreciable quantities of lead and zinc. These rocks comprise all the geologic groups that make up the Ozark Uplift, and each group has been considered the immediate source of the metals by one or more writers on the geology of the ores.

The Government reports of 1901 and 1907 expressed the view that the metals were derived in whole or in part from the Cambrian and Ordovician dolomitic limestones from which they were brought up by an artesian circulation and deposited in openings in the Mississippian limestones. The present report, the result of several years' study, likewise holds that the ores were deposited by ascending artesian solutions which derived the metals chiefly from the Cambrian and Ordovician limestones.

Among the items of evidence cited in support of this view is the fact that natural waters of the type found in the deep wells of the Joplin district commonly carry zinc as well as lead and other metals. A large number of analyses of such waters are given, among them several analyses of waters from deep wells in the Joplin district or from the region in Kansas and Oklahoma bordering the Ozark Uplift. These wells draw their supply from the Cambrian and Ordovician limestones and their waters not only carry traces of zinc and lead, but when they are allowed to stand in tanks or reservoirs for a while they deposit a sediment that shows considerable proportions of these metals. The sediment from a waterworks reservoir in Kansas showed a total of 8 pounds of zinc sulphide which had been deposited in a year.

Other evidence is afforded by the relation of the ore deposits to the present distribution of the Chattanooga shale. This shale covers the Cambrian and Ordovician formations over a part of the Ozark Uplift and acts as a septum between these rocks and the Mississippian above to prevent the ascent of solutions from below. Over the area underlain by this impervious shale there are no ore deposits.

Much other evidence in showing that the ores were deposited by ascending artesian water is presented in a report just published by the United States Geological Survey as Bulletin No. 606, which may be had free on application to the Director, at Washington, D. C.

DEVIL'S TOWER, IN WYOMING, IS AN INTERESTING FREAK

Devil's Tower, in Wyoming, a cut of which appears on the cover of this issue, is a huge shaft of igneous rock on the bank of the Bellefourche River, north of the Black Hills, in the central part of Cook County. It is far from settlements, but is dimly visible from the Burlington Railway, forty miles distant.

It rises nearly perpendicular, 600 feet from the top of a mound. The mound itself is 600 feet high. The base of the mound is cut by the river, exposing high cliffs of sandstone of a brilliant red color.

The great tower is 200 feet in diameter at the top, and tapers somewhat to its base. It is of porphyry, with a vertical columnar structure resembling a huge bunch of organ pipes. This gives to the sides a most novel flutted appearance.

Some years ago an adventurous visitor drove 100 or more wooden pegs in a crack, and by this means reached the summit.

Moulten rock, pouring from the interior of the earth through a sandstone crack, was the cause of this strange freak.

MANNING CONFERS WITH OPERATORS AND OPERATIVES

On his recent trip to the Middle West, during which he addressed the United Mine Workers' convention at Indianapolis, Director Manning, of the Bureau of Mines, attended a meeting of mine operators and workers in Chicago. He addressed them informally.

Mr. Manning also conferred with the Illinois Mine Rescue Commission on matters pertaining to the mine-rescue and first-aid work.

Photograph by J. S. Diller

BULLY HILL SMELTER

Plant which has been closed since 1910, owing to a smoke controversy. Encouraging results are being obtained in the Bully Hill region in experimental treatment of zinc and copper by the wet process. This eliminates the smoke, and it is expected that this important plant will be able to operate again in the near future.

NEW ORE BODIES ARE DEVELOPED NEAR KINGMAN

At the request of the American Institute of Mining Engineers, F. C. Schrader, of the United States Geological Survey, has given them for publication an article on the Mohave County mining district of Arizona. Mr. Schrader has given particular attention to the mining districts around Kingman.

He regards recent development in the Great Eastern and the Big Jim mines, where substantial ore bodies have been opened up at depths of 500 feet, as of the greatest importance in establishing the exceptional worth of this mining region.

Continuing development in the Tom Reed mine gives added proof of the value of the deposits in the Mohave County district, Mr. Schrader believes.

New Firm Formed

Announcement was made January 17 of the formation of the firm Hall & Paul, consulting engineers and chemists.

The members of this firm will do consulting engineering work and furnish advice pertaining to safety, efficiency and economy in coal-mine operations and the safe and proper use of explosives in mines and quarries.

Special attention will be given to reports on coal properties and operating mining plants.

Clarence Hall is the chemical engineer and James W. Paul the mining engineer of the firm.

SLEDGE TATUM, OF GEOLOGICAL SURVEY, DIES SUDDENLY

After enjoying the position of chief geographer of the Geological Survey for less than a month, Sledge Tatum died last month from stomach trouble.

Mr. Tatum was born at La Grange, Ga., in 1873. He was educated there and had the honor of being one of the youngest representatives ever sent to the State legislature. In 1898 he entered the Government service as a surveyor in the Indian Territory. In 1903 he came to Washington, being detailed to the local office of the Geological Survey. He has lived here since, with the exception of the four years from 1906 to 1910, which he spent in the Panama Canal Zone for the Government.

Mr. Tatum is survived by his widow.

The funeral was held in Washington. The honorary pallbearers were Van H. Manning, W. H. Herron, Thomas Riggs, Frank Johnson, W. J. Peters and W. C. Mendenhall.

INTERESTING DEVELOPMENT IN HARDER'S WORK

Interesting developments are being attained by E. C. Harder, of the United States Geological Survey, who is making a study of the iron ore deposits in the Cuyuna district of Minnesota.

He is engaged in a laboratory investigation as to the action of bacteria in deposits of iron ore. Many interesting features of the action of these minute organisms in extracting iron from natural solution, and accumulating it in sufficient quantities to form ore bodies, are being developed.

BIG OPERA HOUSE OPENED IN ISOLATED MINING CAMP

The Raleigh Coal and Coke Company, of Raleigh, W. Va., began a new chapter in coal mining history when an opera house seating 1,000 persons was opened. President John M. Wright, accompanied by Mrs. Wright and A. A. Liggett, secretary of the company, were present to see the big event.

The opera house is situated in the heart of the mountains.

The significance of the event is that a great corporation is opening the doors of education, art, science and literature to workers, binding them by the great ties in common brotherhood.

The miners will take over the opera house as a business enterprise, work out its success and their own destiny at the same time. The company built and equipped the house and now turns it over to the Raleigh Mining Institute, an organization of the miners and employees and officials, to operate for the benefit of all. This welfare work has scored the greatest success. The opera house will be conducted by an executive committee of the institute to make it self-sustaining. A sinking fund to be used in the redemption of the opera house from the company will be provided.

The committee, comprising an officer of the company, aided by the sons of miners, will compete with two other executive committees of the institute. These young men have managed the institute work so effectively that it is paying for itself. Lectures, picture shows, study and discussion of mining problems and social questions have made these young mountaineers self-reliant, able, skillful and capable of doing things. The executive committee projected and secured a fine, large baseball park, which the company paid for, equipped and turned over to the committee last spring. This ball park was expected to sustain itself.

There are three bands among the employees of the company.

The Raleigh Coal & Coke Company owns and operates six mines on Paint Creek, employs approximately 1,000 men, sustains and helps some 6,000 people in Raleigh, furnishes amusement and entertainment, instruction and fine ideals and ambitions to the town of Beckly near by, and makes a market for a large farming population throughout that section of the State. The Mining Institute is composed of 200 brawny and brainy young men clerks, officials and miners. The company has built a garage with thirty-two stalls for automobiles owned by miners. A library and two churches, one for the colored population and one for the white, are sustained. Good schools are furnished and the people are taught to sustain themselves and educate themselves and carry on their own municipal and home affairs.

DIRECTOR SMITH SPEAKS ON INTEREST IN WATER POWER

The people's interest in water power is served only through use, said George Otis Smith in an address on the nation's water-power resources before the Pan-American Scientific Conference. Continuing, he said:

Since flowing water is a continuing source of power the contribution of this resource to the public welfare is proportionate to the promptness and efficiency of the development of every power site. Wherever the resulting energy can be put to work at a cost justified by results nonuse of a water power is an economic waste. It is well, however, to qualify the statement of an eminent authority that from the conservation standpoint "any use is better than no use at all." A more far-sighted view is desirable; better not even a partial development now if thereby the full utilization that may be needed in the near future is blocked.

From the standpoint of the public what is needed in water-power utilization is efficient development that will meet present market demands and effective regulation that will secure to all the parties interested a participation in the benefits of that development. This may seem a simple program, but its large importance comes from the fact that water-power resources will possess much greater value to society in the future.

The stage at which we find power development on the public-owned sites today is simply this, as described by Secretary Lane in his recent report: "The Government was generous, but it had no intention of being a spendthrift. When it found itself being imposed upon . . . the nation stayed its hand and drew back, so as to make sure of the right course. It wished use —use by as many as possible and the best use."

Cheap power promises to be in some future century this country's largest asset in the industrial rivalry among nations. Our unsurpassed coal reserves reinforced by these water-power resources constitute a strong line of national defense in that they form the real basis for an industrial organization of the nation's workers. It is only through abundant and well-distributed power that the other material resources of the country can be put to their highest use and made to count most in the nation's development. The people's interest in water power is greatest in its promise of future social progress, and such an interest is well worth protecting.

SURVEY GETS $100,000 IN URGENT DEFICIENCY BILL

The urgent deficiency bill carried $100,000 for the Alaskan work of the Geological Survey. This is in no sense a deficiency but provides for expenses in the Alaskan work which cannot wait until the regular appropriation is available. It would be very much better if the money for all the field work in the Survey were available at the beginning of the calendar year rather than the fiscal year.

SALT LAKE CITY GREATEST FLOTATION CENTER IN U. S., SAYS METALLURGIST

Declares Hub of Western Mining Is Now Utah City Instead of Denver—Bureau of Mines Station Making Headway with Work on Low Grade and Complex Ore Problems

Salt Lake City, January 25.—Statistical studies by the Department of Metallurgical Research of the State School of Mines of the University of Utah, which is working in cooperation with the Salt Lake City Station of the United States Bureau of Mines as to the distribution or ores and the location of smelters in the western United States, has shown that Salt Lake City is near the center of production of most of the valuable metals, being almost exactly in the geographic center of western metal production.

For years Denver has been the actual commercial center for the manufacture of mining machinery and it is in Denver that a great many of the prominent consulting mining engineers and metallurgists have their offices. Salt Lake City being so much closer to the geographic center of the metal production and having railroad lines radiating in all directions, should be the logical mining center of the Western States, say Utah mining men. Several of the prominent mining supply houses have branches in Salt Lake City, but with the continued increase in the production of the mining and metallurgical industries, the natural condition of things should be the eventual moving of the headquarters of these companies to Salt Lake City, they say. A prominent metallurgist states that Salt Lake City is probably the greatest flotation center in the United States, already having three organizations whose contributions to the art of floating minerals have been larger than almost any other one district in the country. Technical men have come considerable distances to visit these three institutions, which are the General Engineering Company, which is exploiting the Callow flotation machine; the Utah Copper Company, which is exploiting the Janney flotation machine, and the Department of Metallurgical Research of the University of Utah, under the direction of the local station of the United States Bureau of Mines, which is conducting research work on flotation problems vital to the industry in general.

MAY GET LABORATORY

One of the things investigated while in the East by D. A. Lyon, metallurgist in charge of the Salt Lake City office of the United States Bureau of Mines, at the University, was the offer of one of the largest electrical manufacturing companies to establish an electro-metallurgical laboratory in Salt Lake City, either in charge of the local station of the Bureau of Mines, or else closely connected therewith, to study methods of applying electricity in metallurgy, especially for electric furnaces and for electrolytic methods for depositing metals from solutions. It is very well known that in the West there are many hydro-electric power plants which have already developed hydro-electric power or could do so, for which they would like to find a market. Power delivered to small consumers for the purpose of lighting houses and cooking is subject to a high cost of distribution, while power delivered in large blocks to metallurgical or chemical plants can be produced at a very small fraction of what it costs the small consumer. It is known that an electric horsepower along Snake River in Idaho can be generated for about $10 a year under the most favorable circumstances. Montana, Utah, Colorado and Washington have very promising power sites which might very well be utilized in the treatment of complex ores if methods can be worked out for them. Mr. Lyon is now looking over the situation in the West to see if he can recommend to the company in question problems of sufficient magnitude and promise for them to install a laboratory in Salt Lake City.

WORK WITH ORE PROBLEMS

Three of the staff in the Department of Metallurgical Research of the State School of Mines at the University, which department is working in cooperation with the Salt Lake City station of the United States Bureau of Mines, are at work on the treatment of the low-grade and complex ores of the State. This is a very timely subject, as the average amount of zinc in the ores of lead, copper, silver and gold which are now going to the smelters is quite large.

Zinc is a valuable metal and yet the shippers of ores of other metals who are unfortunate enough to have zinc also present in their ore are never paid for it. In fact, they are penalized for the zinc content of their ores. Here is an opportunity to turn a loss into a profit by removing the zinc from these ores before they go into the smelters, and selling the zinc removed.

The method used is to roast the sulphide ore and then treat with a solution of sulphuric acid. Oxidized ores do not require the roasting. The zinc is thus dissolved out of the ore and can be recovered from the solution by the application of the electric current, giving a product that contains fewer impurities than the ordinary kinds of zinc and which is especially adapted to brass making. Sulphuric acid can be made from the smelter fumes which are now going to waste and often causing damage to the farms in the immediate vicinity of the smelters.

Members of the Salt Lake City station of the United States Bureau of Mines, who are directing the above work, presented the problem at the Salt Lake meeting of the A. I. M. E. a little over a year ago, and a lively discussion followed. Since then one of the smelters near Salt Lake has experimented with the process proposed and is now building a plant to apply it. A number of smelters outside of the State have also taken up the idea and the method bids fair to become an important factor in western metallurgy and mining.

TO BUILD ACID PLANT.

Announcement was made by C. W. Whitley, General Manager of the American Smelting and Refining Company, at Salt Lake City in December, that the first 100-ton unit of a sulphuric-acid plant would be built in the Salt Lake Valley at once and additional units added as needed. The exact location of the plant has not been announced, but it is believed it will be at Garfield, where the company has one of its Utah smelters.

A new company, in which the Utah Copper Mining Company and the American Smelting and Refining Company will participate, will be formed to build and operate the plant.

In an interview published at Salt Lake, Mr. Whitley says:

"We have not decided upon what process will be adopted. I can only say that it has been definitely decided that a plant will be built. The plans are now being made, and it will not be long before they are out.

"There are several processes that can be used and one of these will be decided upon. The plant will make various grades of acid, both for commercial use and for leaching of low-grade ores.

"We will have an expert acid man in charge and the plans are just beginning to take definite form. An appropriation has been made for the work and there will be no experimental work necessary.

"While in the east offers of contracts for sulphuric acid came from various sources and I could have made contracts for almost any figure. There is a great demand at present for acid."

STOPS SMELTER FUMES.

In speaking of the new plant, Col. D. C. Jackling, Vice-President and Managing Director of the Utah Copper Company, says:

"Our plans have not been completed and are still somewhat indefinite. Work will be started in the next few weeks and from then on the plans will progress.

"The Utah Copper will participate in the building of the plant and the making of acid will do away with the smelter fumes."

CARPENTER RESIGNS.

Announcement was made at Salt Lake City, December 31, that E. L. Carpenter, President of the United States Fuel Company, had tendered his resignation and requested to be relieved about February 1, or as soon as his successor had been named.

Mr. Carpenter is one of the best-known coal operators of Utah and has been prominent in developing the industry in that State since 1884, except for a few years when he was in New York, New Mexico and Boston, as an officer of various coal interests. He was with the Utah Fuel Company from 1884 until 1902 when he became manager of the New York office of the Consolidated Coal Company. He was general manager of the Phelps-Dodge coal interests in New Mexico from 1906 until 1909 when he went to Boston as assistant to the president of the United States Smelting and Refining and Mining Company. In 1912 this company bought the Castle Valley Coal Company, the Consolidated Fuel Company, the Black Hawk Coal Company, and later the Panther Coal Company, Mr. Carpenter being placed in charge of the combined companies as president. These companies were recently reconstituted as the United States Fuel Company, with Mr. Carpenter as president.

Mr. Carpenter as a member of the Utah Chapter of the American Mining Congress rendered valuable service in the organization of the Chapter and is at the present time its Second Vice-Governor.

As soon as Mr. Carpenter is relieved of his duties at Salt Lake he and Mrs. Carpenter will pass several months in visiting principal cities of South America.

PRESIDENT ASKS COOPERATION OF MINING ENGINEERS

The President, under date of January 13, addressed the following letter to W. L. Saunders of the American Institute of Mining Engineers:

"The work which the American Institute of Mining Engineers has done through its members on the Naval Consulting Board is a patriotic service which is deeply appreciated. It has been so valuable that I am tempted to ask that you will request the institute to enlarge its usefulness to the Government still further by nominating for the approval of the Secretary of the Navy a representative from its membership for each State in the Union, to act in conjunction with representatives from the American Society of Mechanical Engineers, the American Society of Civil Engineers, the American Institute of Electrical Engineers, and the American Chemical Society, for the purpose of assisting the Naval Consulting Board in the work of collecting data for use in organizing the manufacturing resources of the country for the public service in case of emergency.

"I am sure that I may count upon your cordial cooperation."

ENGINEERS NAME COMMITTEE ON REVISION OF LAWS

The Committee on Revision of Mining Laws of the American Institute of Mining Engineers appointed by President Saunders are: James R. Finlay, D. C. Jackling, Hennen Jennings, C. F. Kelley, and E. B. Kirby.

NEW CHIEF GEOGRAPHER NAMED BY SURVEY

William H. Herron has been appointed acting chief geographer of the United States Geological Survey, to take the place of the late Sledge Tatum.

Claude H. Birdseye at the same time was appointed topographic engineer in charge of the Rocky Mountain division. Glen S. Smith has been given charge of the central division.

The new chief geographer is well known to mining men in many parts of the country. He is especially well known in Michigan, where, with State Geologist Allen, he has covered a considerable portion of the mining area of that State. He is also well known in Missouri, where he was associated with State Geologist Buehler in topographic work in the lead and zinc mining sections. In addition, Mr. Herron has made a large number of topographic surveys in Colorado and in the Black Hills section of North Dakota, where his work had an intimate connection with mining operations.

Mr. Herron was born in Monticello, Ill., November 20, 1865. His education was secured at Columbia University. He did his first work for the Survey July 1, 1885.

Among the more recent work in charge of Mr. Herron was the mapping of the Newcastle, Wyo.; Bonner, Mont., and Aladdin, Wyo., quadrangles.

In 1906 he had supervision of the northwest section of the eastern topographical division of the United States. The following year he became geographer in charge of the central section. In 1908 he was promoted to geographer in charge of the central division.

Mr. Herron is a member of the American Association for the Advancement of Science, Chicago Engineers' Club, and the Geographic Society of Washington.

For Married "Booze" Fighters

Mining World.

To the married man who thinks he cannot get along without his regular drinks, the following is suggested as a solution to the bondage of his habit:

1st. Start a saloon in your own house.

2d. Be the only customer, and you will have no license to pay. Give your wife $2 to buy a gallon of whisky, and remember there are only 69 drinks in a gallon.

3d. Buy your drinks from no one but your wife, and by the time the first gallon is gone she will have $8 to put in the bank and $2 to start business again.

4th. Should you live ten years and continue to buy booze from her, and then die with snakes in your boots, she will have money enough to bury you decently, educate your children, buy a house and lot, marry a decent man and quit thinking about you.

WILLIAM H. HERRON

New Chief Geographer of the United States Geological Survey.

JUDGE MORROW PRAISES SURVEY'S GUIDE BOOKS

Typical of the appreciation of the public of the guide books of the Geological Survey is the following letter from Judge William W. Morrow, of the United States Circuit court of Appeals at San Francisco. Judge Morrow says in a letter to Director George Otis Smith:

"I wish to report that I enjoyed my return trip home immensely. With your guide book to the 'Overland Route' in hand, I sat in the observation car from early morning to late at night, scanning the geological formation as it drifted by, reading the historical and industrial data relating to the stations and sections of the country, and generally making myself acquainted with the Overland Route, which I have passed over more than fifty times, but without acquiring much valuable information about it until this time.

"This guide book is splendid, and I have no doubt the others are equally meritorious. They are great books and ought to be in the hands of all the western travelers. They are educational and immensely interesting. I congratulate you upon this specially good work of your bureau."

ACCUMULATED DATA OF SERVICE TO THE PUBLIC

The following extract from a Geological Survey letter shows how the Survey is able to assist the public by drawing on the information and data which it has accumulated during the thirty-six years of its existence. The letter in question is in response to an inquiry from a principal of schools as to the depth at which artesian water may be secured in a certain section of land on which he has filed a claim.

"The vicinity of Trinchera is covered by Geological Folio 58, the Elmoro Folio, which contains a discussion of the underground water and maps showing the artesian conditions in that vicinity. According to this folio water-bearing beds of the Dakota sandstone occur between 600 and 800 feet below Trinchera, at less depths to the northeast, and at greater depths to the southwest thereof. Wells drilled to this formation may not produce flows but may yield considerable water if they are pumped. The term "artesian" is used in this folio for wells in which the water rises under pressure, although these wells may not overflow at the surface."

"USEFUL MINERALS" TO BE WORK OF MUCH VALUE

A large demand is anticipated for a forthcoming bulletin by the United States Geological Survey on Useful Minerals of the United States. The work on this report is about completed. It is being done by F. C. Schrader, who has put in more than a year's work on the volume.

This is the third bulletin of this character to be issued by the Survey. The one of two years ago has been greatly in demand, and copies available for distribution were exhausted shortly after issue.

The new bulletin will bring all matters treated in the former work up to date, and also will contain much additional information. It will point out in detail the influences which the war has exerted upon the minerals of the United States.

PRELIMINARY BULLETIN ON TINTIC DISTRICT

An extensive report upon the Tintic mining district of Utah, by W. Lingren and J. H. Loughlin, of the United States Geological Survey, is ready for publication. As it will be some time before the complete report can be printed, a brief statement of results has been compiled and will be issued as a preliminary bulletin. It should be available about March 1.

Information is the very foundation of all right action in legislation.—WOODROW WILSON.

PHILIPPINES PROFIT BY ABSENCE OF APEX LAW

Among the very earnest advocates of the abolition of the Apex law is H. C. McCaskey, head of the Mineral Resources Division of the United States Geological Survey.

Mr. McCaskey was formerly the head of the Mining Bureau in the Philippine Islands where vertical end and side lines determined the boundaries of claims.

It was Mr. McCaskey's experience in the Philippines that American operators and prospectors when they first began work in the Philippine Islands were hostile to the mining regulations and clamored for the Apex law and other regulations to which they had been accustomed in the United States. But he found that in a very short time they became accustomed to the different regulations, and soon were enthusiastic supporters of the vertical boundaries.

The Philippine Islands were given mining laws in an Act of Congress, No. 235, approved July 1, 1902. The law provided for vertical end and side lines as marking the boundaries of claims, and made various other changes in the laws which govern Continental United States. As a result there has been very little litigation.

The principal objection to the mining code as applied to the Philippine Islands is the greatly restricted limitation on the number of claims that may be held on any one vein.

BUREAU OF MINES TO CHANGE STATION TO GOLDEN, COLO.

The Bureau of Mines station at Denver will be moved to Golden, Colo., on or before July 1. Arrangements have been completed whereby the Bureau of Mines and the Colorado School of Mines will cooperate in experimental work. This arrangement will do away with certain duplications of effort that have existed.

The contract making possible this arrangement was signed in Washington late last month by Van H. Manning, director of the Bureau of Mines, and by William B. Phillips, president of the Colorado School of Mines.

The School of Mines will allow the use of its engineering hall, experimental mill, testing plant and laboratory. The Bureau of Mines will move its Denver equipment to Golden and will add some new apparatus. The work will be conducted by the employes of the Bureau of Mines and under the sole direction of the Bureau.

Recovery of values from low grade and complex ores will be the chief object of the research work. It will be confined largely to studies of Colorado ores.

SAFETY-FIRST WEEK IS TO BE OCCASION OF GOVERNMENT EXPOSITION

Secretary of the Interior Makes National Affair of Inter-Bureau Exhibit of Safety Devices—State Mine Inspectors To Meet in Convention While Exhibition Is In Progress

"Safety-First" week, February 21–26, is to be made an important event through the co-operation of various federal bureaus.

Every bureau having jurisdiction over any feature of safety or conservation work will have an exhibit showing in detail the work it has in hand. This exhibition will take on a national aspect, as manufacturers and operators from all over the country are invited to be present, in order that they may see what the Government of the United States is doing in "safety-first" work.

The Bureau of Mines will have one of the largest exhibits. It will have 700 square feet of floor space devoted to mine-rescue apparatus and other exhibits which will show the class of work it is conducting and the success which is attending its efforts.

The idea of "Safety-First" week originated in the Bureau of Mines. Director Manning thought well of the plan and laid it before Secretary Lane. Mr. Lane thought it an excellent idea, and in addition to the exhibits, he suggested that it be made the occasion of a gathering of all state mining inspectors, and others who are interested in first-aid work and in the conservation of life and health.

As a result Mr. Lane sent to the Governors of each State in which mining is conducted, asking that they send the state mine inspector to Washington during "Safety-First" week, and in addition send another representative of some state activity having an interest in the subject.

President Wilson is much interested in the success of the activities planned for the week and has written Mr. Lane as follows:

"Thank you for calling my attention to the proposed Safety-First Exposition by various Federal bureaus to be held at the Smithsonian Institution from February 21 to February 26. I sincerely hope that I can find an opportunity to be present on one of those days. Particularly at this time it is wise and wholesome that the Federal Government should call the attention of the people of the country to what the Government is doing to preserve life, the greatest of all the resources of the nation.

"The rescuer of the Bureau of Mines who braves the poisonous gases of a mine and saves a miner from death; the coast guard who at the peril of his own life saves the passengers of a helpless vessel from death; the surgeon of the Public Health Service who stops a dreaded scourge in its incipiency and saves thousands of lives; the engineer who succeeds in reducing the hazards of his industry to its men; and the man who brings about better conditions of living among the people, I consider all types of the hero who will be most regarded in the near future.

"The Federal Government is doing an exceedingly helpful work along just such lines and I doubt if the public appreciates how extensive and important that work is. I especially like your idea of making this as much as possible a national affair. Every manufacturer, every railroad man, every miner, every operator, every workman, and every humane person in the country ought to be interested. I sincerely wish you success in this undertaking."

The exhibition is in charge of a committee headed by Major William Lyster, of the Army Medical Corps. Morton F. Leopold is the secretary of the committee.

The bureaus concerned and the men who will be in charge of the exhibition are as follows:

Department of Commerce—W. J. Canada, Bureau of Standards; W. F. Peabody, Coast and Geodetic Survey; H. B. Bowerman, Bureau of Lighthouses; C. C. J. Norris, Steamboat Inspection Service; W. D. Terrell, Bureau of Navigation.

Navy Department—This department has four bureaus taking part and has requested the amount of 600 square feet for their combined exhibit.

Department of Agriculture—Benjamin C. Kadel, Weather Bureau; C. A. Lindstrom, Forest Service.

Department of Labor—Lucian W. Chaney, Bureau of Labor Statistics; Miss H. Summer. Wall space only desired.

War Department—Major William Lyster, Army Medical Corps.

Treasury Department—Asst. Surg. Gen. W. C. Rucker, Public Health Service; Lieut. H. H. Wolf, Coast Guard Service.

Department of the Interior—M. F. Leopold, Bureau of Mines; W. S. Deffenbaugh, Bureau of Education; R. B. Dole, Geological Survey; C. F. Hauke, Indian Office.

District Government—Major Raymond Pullman, Superintendent of Police, Washington, D. C.

Latest Legal Decisions

INTERSTATE CARRIAGE OF COAL

The act of 1906 (34 Stat. 585) does not forbid a railroad company holding stock in a coal mining corporation, if such corporation be a bona fide organization; and coal mined and produced by such a corporation may be lawfully carried by a railroad company although such railroad company is a stockholder in the mining corporation; and this is true without regard to the extent of the railroad's stock ownership, whether a part or the whole; but under such circumstances the railroad company must not use the power given by such ownership to obliterate the distinction between the two organizations and must not exert its power so as to comingle indistinguishably the affairs of both and thus cause the two corporations to be one for all purposes and it must not destroy the entity of the producing or mining corporation and thus make the two virtually one; and if it actually do those forbidden things, then the commodities' clause applies and condemns as unlawful such abuse of a lawful right. The fact that the capital stock of a railroad company and of a coal company was owned by a holding company and the coal mined by the mining company was carried by the railroad company is not an offense against the commodity clause of the statute where it is made to appear that the railroad company did not mine or produce the coal transported for the coal company, and where the railroad company did not own or have any interest, direct or indirect, in the coal transported.

United States *vs.* Reading Co., 226 Fed. 229, p. 273.

COMBINATION OF COAL COMPANIES

A combination by which a holding company, already the owner of the capital stock of a railroad company and of a coal company, purchased the majority stock in another railroad company which owned practically all the stock of another coal company, where it appears that the two railroads have been carrying anthracite coal of these two large producers to the same markets where the coal has been sold in competition and where it appears that these two carriers transport practically one-third of the total tonnage of anthracite coal carried by the railroads that reach the anthracite field, and the two coal companies dispose of more than 20 per cent of all the anthracite coal sold on the market, is a union of the two companies in the same ownership that creates a combination in restraint of interstate trade in violation of the Sherman anti-trust act.

United States *vs.* Reading Co., 226 Fed. 229, p. 271.

LIABILITY FOR INJURIES

The mining act of Pennsylvania does not relieve the owner or operator from liability for his own neglect or failure of duty and there may be cases in which both the mine foreman and the mine owner may be liable to an injured miner. Thus if through any neglect or failure of duty the mine owner causes an injury to one of his employees the general rule applicable in such case subject the owner to damages for such default; or if there is a dangerous condition existing in the mine which is permitted by the negligence of the mine foreman, resulting in injury to an employee, the mine owner will be responsible if he has knowledge of the fact and takes no steps to remove such dangerous condition, as the owner cannot neglect this duty and escape responsibility as the statute requires the owner to use every precaution to insure the safety of the workmen in all cases, whether provided for in the statute or not.

Barnes & Tucker Coal Co. *vs.* Vozar, 227 Federal, 25, p. 29.

DEGREE OF CARE REQUIRED

Ordinary care may be defined to mean such care as is usually exercised by ordinarily careful and prudent persons under like or similar circumstances to those involved in a particular case.

Nebo Coal Co. *vs.* Barnett (Kentucky), 180 Southwestern, 79, p. 81, December, 1915.

NEGLIGENCE DEFINED

Negligence may be defined to mean the failure to exercise ordinary care, or such care as is usually exercised by ordinarily careful and prudent persons under like or similar circumstances to those involved in the particular case.

Nebo Coal Co. *vs.* Barnett (Kentucky), 180 Southwestern, 79, p. 81, December, 1915.

GROSS NEGLIGENCE DEFINED

Gross negligence may be defined as a failure to exercise slight care.

Nebo Coal Co. *vs.* Barnett (Kentucky), 180 Southwestern, 79, p. 81, December, 1915.

NOT AN OFFENSE

The fact that the coal land holdings of a coal company are large and that the coal company ships and sells the largest per cent of all the anthracite coal that reaches the market, is not alone sufficient to constitute an offense against the Sherman anti-trust act, in the absence of any showing of harm or injury. Under such circumstances but three classes of persons could be injured: (1) rival producers on a large scale who might be injured by unfair methods of competition; (2) smaller producers who might suffer by similar methods; and (3) the consumer who might suffer by extortionate prices. But in the absence of proof that either of these classes of persons has sustained injuries, the charge of unlawful competition or restraint necessarily fails.

United States *vs.* Reading Co., 226 Fed. 229, p. 268.

MINING TAXES

While under no allegation of general ownership a party, either plaintiff or defendant, may prove the character of such ownership by proving adverse possession and payment of taxes, yet however general the pleadings in that regard may be in case the surface ground of a mining claim is not questioned, the evidence and findings upon the question of payment of taxes should be direct and specific, and it should be found whether merely surface possession together with improvements is claimed, or whether the title to the whole claim is asserted; and in either event the assessment and payment of taxes should be shown and found so that a court may determine the relative rights of the surface and mineral owners.

Utah Copper Co. *vs.* Exkman (Utah), 152 Pacific, 178, p. 180, October, 1915.

KNOWLEDGE OF DANGER

A miner in an action for personal injuries is entitled to have his case submitted to the jury where his injury was caused by the breaking of a jack pipe furnished him by the machine boss, where the miner knew the pipe was rusty and to the use of which he objected but was assured by the mine boss that it was good for two or three months, and that he, the boss, knew better than the miner, and where the superintendent assured the miner that the machine boss would see that a new pipe was furnished and directed him to go on with the work until a new pipe was furnished, though the testimony of the injured servant was contradicted by both the machine boss and the superintendent.

Keystone Coal & Coke Co. *vs.* Petrovich, 227 Federal, 43, p. 45.

COMPROMISE CLAIM

A widow whose husband was killed in a mine because of the alleged negligence of the mine operator, and who waived the right to take out letters of administration and administer upon the estate of her husband and sue for the wrongful death, may after the appointment of a third person as administrator compromise and settle the claim against the mine operator for damages because of the alleged negligence resulting in the death of her husband, and a receipt and release executed by her in payment, settlement and compromise of such claim may be pleaded in bar of an action brought by the administrator. It is immaterial in such case that the administrator was appointed before the widow effected the compromise, and the result is not changed by the fact that she consented to the appointment of the administrator, as her superior right to control the claim by compromising it, or by bringing suit on it herself, can be in no wise impaired by the qualification of the administrator and her superiority continues until she in some manner waives it and the waiver of her right to administer is not tantamount to a waiver to her right to sue or to settle, though this power may in fact be exercised to the detriment of her interests. The settlement made by the widow cannot be impeached by the administrator on the ground that it was fraudulently procured, as the widow alone could take advantage of any alleged fraud.

Spitzer *vs.* Knoxville Iron Co. (Tennessee), 180 Southwestern, 163, p. 164, November, 1915.

CONDITION OF MACHINERY

In an action by a miner for injuries caused while cutting coal and due to the alleged defective condition of the machine used, in that when the air was turned on it caused the machine to start with a jerk and such resulting jerk caused the injuries complained of, and where it was claimed that if the machine had been in good order it would have worked smoothly when the air was turned on and the accident would not have occurred, the question, under such circumstances, as to whether or not the defective condition of the machine was the proximate cause of the injury is one of fact to be determined by the jury.

Stearns Coal & Lumber Co., *vs.* Calhoun (Kentucky), 179 Southwestern, 590, November, 1915.

While the boss driver cannot be presumed to have any right to order his assistant to take part in the work of repairing a wreck of trip cars, this being a distant branch of the mining service and outside of the scope of the boss driver or his assistant, yet a court may presume that the boss driver had authority to suspend his assistant from his regular employment and place him under the orders of a bank boss, a common superior, for any particular service for which he might be needed, and as to which such bank boss might command or except his services, and where such assistant boss driver was killed while aiding in such work outside of the scope of his employment, the operator may be liable for his death, if it is shown that the bank boss ordered such assistant boss driver to perform the service he was rendering at the time he was killed, or if the bank boss implicitly authorized it by knowingly accepting the service, then the operator would be liable for the death of such assistant boss driver.

Republic Iron & Steel Co. *vs.* Quinton (Alabama), 69 Southern, 604, p. 606; July, 1915.

The rule of approximation is now applicable to placer mining locations and entries upon surveyed lands, to be applied on the basis of 10-acre legal subdivisions.

McKittrick Oil Co., in re, Land Decisions, August 13, 1915.

Current Federal Legislation

Thus far 14,662 bills have been introduced in Congress, 4,092 in the Senate, and 1,570 in the House of Representatives. Of these bills, 1,247 were introduced in the Senate during the month of January and 3,796 in the House of Representatives during the same period.

Of the bills synopsized in our last issue, S 52, providing for a commission to suggest amendments to the mining laws, was passed by the Senate, substituted before the House Committee on Mines and Mining for H. R. 18, and killed in the committee by adverse vote. Fuller report upon this bill will be found elsewhere in this issue.

H. R. 153, creating a Bureau of Labor Safety in the Department of Labor; was passed by the House of Representatives, carrying an amendment as follows:

> Provided that nothing in this act shall be held to repeal, modify or affect any other act of Congress in force at the time of the passage of this act.

H R 408, providing for the leasing of water power sites on the public demain, was passed by the House of Representatives, and being referred to the Senate Committee on Public Lands, an entirely new bill was substituted and this bill is now upon the Senate calendar for consideration.

H R 406, providing for the leasing of lands upon the public domain, containing coal, phosphate, oil, gas and potash, was passed by the House of Representatives and is now being considered by the Public Lands Committee of the Senate. Hearings thereon began February 2.

The following bills of interest to mining men were introduced during the month of January

SENATE BILLS

S. [illegible], by Mr. Sutherland, providing compensation for accidental injury to employes of the United States.

S. [illegible], by Mr Sutherland, providing for acquiring a site and erecting a national memorial to irrigation, at Salt Lake City.

S. [illegible], by Mr. Martine, providing for a permanent exhibit of the resources of the States of the Union in or near Washington, D. C.

S. [illegible], by Mr Smoot, granting to the State of Utah the Fort Duchesne reservation for an agricultural college.

S. [illegible], by Mr. Warren, granting certain coal lands to the town of Kaycee, Wyoming.

S. [illegible], by Mr. Brady, providing for the establishment and maintenance of mining experiment, mine safety and assay stations, for making investigations and preparing and [illegible] information to those engaged in mining, for keeping records of mining properties, for making assays for prospectors, and for other purposes.

S. [illegible], by Mr. Thomas, providing that any suit involving the rights or interests of a State or States, not of a political nature, may be brought against the United States, the Supreme Court of the United States being given exclusive jurisdiction.

HOUSE BILLS

H. R. 6887, by Delegate Wickersham. This bill is substantially the same as S. 869, by Senator Pittman, synopsized in the January issue of the Journal.

H. R. 6902, by Mr. Hayden. This bill provides for the reservation of lands within the Colorado River Indian Reservation, bearing coal, oil or other non-metalliferous minerals, and further provides that lands containing metalliferous minerals may be entered under the general mining laws, except that the price therefor shall be ten dollars per acre, and providing that any locations made in good faith upon the lands, in said reservation, prior to July 1, 1914, may pass to patent under the general mining laws, the money paid therefor to be credited to the Indians of said reservation.

H. R. 8807, by Mr. Hayden. This bill provides that all patents on lands hereafter located shall reserve a right of way for utilities constructed by authority of the United States.

On the introduction of the general leasing bill in the Senate, it was referred automatically to the Committee on Mines and Mining. The same bill, in the Sixty-third Congress, was given to the Committee on Public Lands, which held hearings on it, and reported it out favorably. In the Sixty-third Congress the matter of reference proved so vital that it was debated three days in the Senate and then voted on. By a vote of thirty-four to nineteen the measure was sent to the Public Lands Committee.

Senators Shafroth, of Colorado, Walsh, of Montana, and Pittman, of Nevada, figured prominently in the recent discussion. On the roll call the Yeas were forty-six and the Nays twenty-three, so that the bill was changed from the Committee on Mines and Mining to the Committee on Public Lands.

Senator Pittman, of Nevada, a member of this committee, declared: "There is no question that there are going to be hearings on the power bill that will run for weeks, if not for months. The fact that the committee reported it out favorably at the last session does not mean that it is not going to consider it at this session."

SURVEY IS BORING FOR POTASH NEAR AMARILLO

A depth of 200 feet has been reached in the well which the United States Geological Survey is boring near Amarillo, Tex., in the hope of discovering a deposit of potash. The well will be sunk, if necessary, to a depth of 3,000 feet. The work is in charge of the Survey's own employes, and a chemist is present continually to take advantage of each step of the exploration work.

Owing to the solubility of potash, no deposits are likely to exist close to the surface. The German deposits do not come nearer than 700 feet of the surface, and are known to continue downward below 3,000 feet.

BOLIVIAN TIN TO BE SMELTED AT BIG PLANT IN THE UNITED STATES

Department of Commerce Removes All Obstacles to the Development of Great Industry in This Country—Bolivian Government Helps in Perfection of Arrangement Which Will Be of Great Benefit to the U. S.

A tin-refining industry is to be established in the United States. Heretofore all tin has been imported in a finished state to be manufactured in this country. A tin smelter and refining plant is being completed by the American Smelting and Refining Company at Perth Amboy, N. J., for the handling of South American ores, according to an announcement from the Department of Commerce.

All arrangements have been made for the importation of Bolivian tin ore. The venture is the first attempt to establish the tin industry in this country.

First word of the new industry was received in a letter from William Loeb, Jr., of the American Smelting and Refining Company, to Secretary Redfield, in which it was stated that the new plant for the smelting of tin ores and concentrates and the electrolytic refining of tin had practically been completed. There were many difficulties in the way of establishment of the industry in this country, he told the secretary, but these have all been overcome.

Heretofore this country has imported about 45,000 tons of tin annually, and about 90 per cent of this came from the Straits Settlements, where an export duty is placed on ores to compel treatment in the Settlements.

LITTLE IS MINED

Although the United States is easily the greatest user of tin, only a small quantity is mined in this country, and no smelting has been done here. Large quantities are received indirectly by way of England, Belgium, and Germany, in normal times. Some of this is from the Straits Settlements and some from the Bolivian mines, the concentrate ore being shipped from the latter country to Europe for further refining. In normal times the United States imports about $50,000,000 worth of tin, which is somewhat more than a third of the world's production. Bolivia produces about $25,000,000 worth annually.

The Bolivian tin, according to Mr. Loeb's letter, contains impurities which, with the established methods of smelting, do not produce a tin suitable for tin plate, but the plant at Perth Amboy proposes not only to smelt the impure ores from Bolivia and other countries, but to refine the product by the electrolytic process. A recent analysis of this electrolytic tin by experienced chemists showed it to run 99.98 per cent pure, while the base metal from which it was produced contained only 93 per cent. For the manufacture of tin plate this tin is pronounced as good as the best Straits tin.

"In addition to building the plant and purchasing the South American tin ores," writes Mr. Loeb, "we are financing the miners by making liberal advances immediately on shipments from South America. We hope eventually to be able to extend our present plant and increase the business considerably. In the initial steps of our negotiations to secure these tin ores, we were greatly helped by the cooperation of the chief of your Bureau of Foreign and Domestic Commerce, the commercial attache of the department in South America, and by the State Department."

There were many obstacles in the way of importing tin ore from Bolivia, some of which have been removed through the assistance of the State Department, and some by the assistance of the Department of Commerce. The whole project was formally launched when Mr. Loeb called at the Bureau of Foreign and Domestic Commerce and outlined the importance of establishing a tin-smelting industry in this country and the difficulties in the way of getting tin from Bolivia regularly and in the required amounts. The bureau immediately got in touch with its commercial attache at Lima, Peru, who thereupon went to Bolivia and started negotiations with the Bolivian Government through the United States Minister. Through these negotiations many misconceptions on the part of the miners were removed, and most of the troublesome points that had prevented the drawing up of mutually satisfactory contracts were smoothed out.

ASSURANCES FROM BOLIVIA

In the meantime the Secretary of Commerce had addressed a letter to the State Department suggesting that the matter of Bolivian export duties be taken up with the Bolivian Government, and that some expression of opinion from that government be obtained as to future interpretation of the old treaty between the two countries. The State Department exchanged notes with Bolivia, and the final result was that the Bolivian minister of foreign affairs signed an assurance that there would be no future discrimination against the United States in the matter of export duties.

The value of a tin-smelting industry to the United States is great, but difficult to estimate in its full importance. The smelting industry itself will give employment to many workers, and will be a great convenience in many ways to the great tin-plate industry. But the purchase of great quantities of ore from a South American country will establish credits on our markets in their favor and lead to the establishment of commercial relations with that country which would otherwise have been difficult to effect. The Bolivian minister, Senor Don Ignacio Calderon, calls attention to this important point by emphasizing the necessity of buying in foreign countries as well as selling there. The ships that carry ore to the United States will carry back American products for South American markets.

USES OF RARE METALS OUTLINED BY U. S. GEOLOGICAL SURVEY

Uses of rare metals have been outlined as follows by the U. S. Geological Survey:

Antimony—Used in Babbitt and other bearing-metals; type metals; "white metal" alloys used as a foundation for silver plate, coffin trimmings, toys, clock frames, etc.; shrapnel and other bullets and shot. Various salts are used in manufactured rubber, enamels for household utensils and wares, in glass making and in dyeing. Used sparingly in pyrotechnics and medicine.

Arsenic—In the elemental form arsenic is used to harden shot and make them take a rounder form. As arsenious oxide, the "white arsenic" or "arsenic" of commerce, it is used extensively in glass; as an insecticide and weed killer. Many other arsenic compounds are also used as insecticides, and others are used to a small extent in dyeing. Small quantities are used in tanning and medicine.

Bismuth—The metal is used as a component of cliché or low melting-point metals and in solders. The various salts such as the subnitrate, sub-galliate, salcylate and others are used in medicine.

Selenium—Used in making red glass, electrical resistances, and cells for measuring light.

Tellurium—Very little use is known for tellurium. A little has been used in coloring glass, and a patent has been taken out for its use in aluminum alloys.

Cobalt—Used in coloring glass and ceremic wares blue; in "high-speed" tool steels; in stellite (an alloy of cobalt, chromium and other metals, depending upon the use to which it is to be put); and in insect poisons.

Molybdenum—Used in ribbon or wire in electrical resistance furnaces; as supports for tungsten filaments in incandescent electric lamps; in "high-speed" tool steels, and, as ammonium molybdate in the determination of phosphorus, and in other chemical work. It is also used in some forms of stellite, and in the Roentgen ray tubes.

Nickel—The great use of nickel is in making nickel steel. A nickel-copper alloy is used as a jacket for bullets; great quantities of nickel are used in plating various metallic objects; and smaller quantities are used in making coins. The American coin known as a "nickel" contains only 25 per cent of nickel; the rest is copper. Various nickel alloys are proposed as substitutes for steel. Monel metal, an alloy of nickel and copper, containing also a small quantity of iron, is made by smelting the Sudbury (Canada) ores, without separation of the metallic contents. Monel metal is used for valves on high-pressure steam engines; as a roofing material, in sulphuric acid pumps; and in other places where a metal highly resistant to ordinary chemical is needed.

Tantalum—Tantalum now is little used. For a time it was used in making filaments for incandescent electric lamps. It has also been used in surgical and dental instruments, and for pens.

Tin—Tin is used largely as a coating for sheet iron or sheet steel, to make tin plate, ordinarily known as "tin," and of which it forms only 1 to 3 per cent; used extensively in alloys for bearing metals, "white metals," etc.; also in making pipes for organs and in many places where a non-oxidizing metal is required.

Titanium—Used in cast iron, steel, and bronzes, largely as a purifier. Titanium potassium oxalate is used as a mordant in dyeing leather and some textiles. Other titanium compounds find a small use. As carbide, ilmenite and oxide it is used in arc lamps.

Tungsten—The great use of tungsten is as a component of the highly complex alloy steels known as "high-speed" steel. In these 14 to 20 per cent of tungsten is used. It is also used in some forms of stellite (see Cobalt). Smaller quantities are used in incandescent light filaments, in electric contacts, Roentgen ray tubes, phonograph needles, and as an alloy with iron in castings for automobile engine valves.

Uranium—Many experiments have been made with the object of using uranium as an alloy in steel, but they do not seem to have been very successful. Uranium alloys with copper and other metals have been placed on the market to be used in brass and other alloy work, principally as deoxidizers. Uranium salts are used in glass and pottery coloring.

Vanadium—The great use of vanadium is as a component of the "high-speed" and other steels. Vanadium is also used as a deoxidizer in steel, bronzes, brasses and bearing metals. Small quantities of vanadium salts are used in various chemical industries.

Radium—Radium is almost wholly used as a curative agent in various diseases, such as cancer, lupus, eczema, arthritis, etc. A little radium is used in making luminous clock and watch faces, house numbers, etc.

Mines Exhibit at Panama

A. A. Krogdahl of the Bureau of Mines, San Francisco, has been furloughed to accept duties with the Panama National Exposition Commission which will have charge of the American exhibit at the Panama Fair, which will open February 21.

The Bureau of Mines sent the principal portion of its San Francisco exhibit to Panama for the fair which will be given under the auspices of that republic.

BIRDSEYE TELLS OF TRIP IN MT. RAINIER BLIZZARD

Claude H. Birdseye, who has just been made chief of the Rocky Mountain division of the topographic section of the United States Geological Survey, is well known among Western mining men. He led a party up Mount Rainier a few years ago. An adventure resulted, which he narrates as follows:

"Our start was made at 5 o'clock in the morning. Our instruments and light rations gave a pack of twenty pounds per man, and we climbed at a brisk rate, reaching the top of Gibraltar at 7:30 and East Crater at 9:30 o'clock—a climb of over 4,000 feet in four and a half hours. We noticed very little wind until the brim of the crater was reached, but once on top the gale was terrific. We at once threw up a rock wall as a wind shelter for the surveying instruments, but before any observations could be made clouds rolled in from an apparently clear sky, preventing any work for the time being. To remain was undoubtedly dangerous, but we decided to take a chance. The study of mountain conditions during the preceding month had proven that no prophecy could be safely made as to summit weather on Mount Rainier. It would be exceedingly discouraging, we felt, to descend and then find that conditions on top had suddenly changed for the better. Consequently, we remained behind our wind shelter until noon. Then the weather suddenly turned much worse and snow commenced to fall. Hastily swallowing a small portion of our lunch, we started the descent, having cached our instruments in a comparatively dry ice cave. Our trail made on the ascent was found obliterated, but we continued down, relying on the direction of the wind for our bearing and realizing that a return to the crater could be made if necessary. The wind veered, however, and when our barometers showed the general elevation of Gibraltar no familiar landmarks or rocks could be recognized. We found ourselves in a labyrinth of crevasses, and soon had to confess that we were utterly lost. Krogh insisted that we were at the head of Emmon's Glacier, while Harmon and I felt that the crevasses were at the head of Nisqually Glacier. Several attempts were made to locate Gibraltar by traveling laterally along the slope of the mountain at the supposed elevation of this rock, but with no results. By 3 o'clock in the afternoon we decided that further descent was impossible, while to remain in the open would be fatal. Consequently, a return to the summit was ordered, and a two-hour climb of danger and torture followed. We now found that new snow had filled the crevasses, making the crossings very dangerous. At times we sunk almost out of sight in the soft smother, but managed to wallow through, and following the steepest slope we reached the crater rim at 8 o'clock, all of us in a state of almost utter exhaustion and chilled through and through nearly to the point of freezing. Here on top we found the blizzard even worse than on the slopes. It was impossible to stand erect on the rim, the men being actually blown back into the crater, where, however, it was possible to travel and see a few yards ahead. We were searching frantically for the steam caves. The first cave encountered looked favorable, and we lost no time in entering. The main cavern had several side galleries, in each of which were steam jets, and we selected the largest opening, about 6x8x3 feet, for our abode. Here we partook of our evening meal—one-half of an orange, one-half cake sweet chocolate and one hardtack per man but best of all, a pint of hot tea, which one of the men had carried in a thermos bottle.

CLAUDE BIRDSEYE
Recently promoted to position of topographic engineer in charge of Rocky Mountain Division, Geological Survey.

"While this steam cave was undoubtedly a life-saver, one can look back upon it with no feeling of real joy. Long before the night had passed we were all dripping wet, thoroughly steamed and half frozen by turn. All took part in pounding and rubbing the others and preventing each other from falling into a fatal sleep. In spite of every effort, some one would drop into a doze, only to be yelled at and rudely awakened by the others. All three of us were thoroughly inured to exposure and hardship but this experience was perhaps a record-breaker. As morning broke and the day advanced with no indication of a change in weather, our sufferings visibly increased With budding hopes, each man would make a trip out on to the rim, only to return with clothes frozen stiff and hopes shattered. It was not until toward noon that the sun appeared at intervals through clefts in the clouds overhead, even then to disappear after shedding a few seconds' warmth. But a rising barometer revived our spirits, and we prepared to attempt a descent at the first indication of a break in the weather Our clothes had long since been steam soaked, but every man carried an extra pair of heavy woolen socks, which we used as mittens, and, although these were wringing wet, we partially dried them by placing them inside our clothing next to the skin. The same crude process of drying and ironing was followed by each with a large bandana handkerchief, which, bound around the head, would afford some protection to the ears and face.

"At 2 o'clock in the afternoon the clouds broke to the eastward, and Gibraltar became visible just where it should be, but where we had failed to find it. No time was lost. Scrambling over the rim, we started down the mountainside, half running, half sliding, sometimes involuntarily slipping and tumbling head first, our only thought being to get off the summit as quickly as possible. Almost instantly all our clothing, as well as our head and hand coverings, were frozen stiff; but this mattered not. Crevasses filled to the brim with new snow proved no obstacle to our rapid progress, which, in fact, became a rout, and the descent to Gibraltar from the crater, nearly 2,000 feet, was made in twenty minutes.

TIN PRODUCED IN ALASKA GOES ABROAD FOR REDUCTION

There just has come from the presses of the Geological Survey a new report on tin mining in Alaska. It is by Henry M. Eakin, who is assigned to geologic reconnaissance and investigation of mineral resources in Alaska.

In discussing tin mining in Alaska, Mr. Eakin, among other things, says:

"The first discovery of stream tin in Alaska was made by the Geological Survey in 1900 on Buhner Creek, in the York district, which occupies the western extremity of Seward Peninsula. This discovery awakened interest in the possibility of finding commercial bodies of tin in this part of Alaska, and in 1901 and 1902 considerable prospecting for stream tin was carried on in this field. The first commercial production of tin ore was made in 1902. From that time until 1911, when the first tin dredge was installed, the placers were worked only on a relatively small scale. Since 1911 the dredge on Buck Creek has operated successfully each season, and in 1914 two dredges were installed on Anikovik River, for the recovery of gold and tin together.

"Lode tin was first discovered at Cape Mountain in July, 1902, by W. C. J. Bartels. The following year Arthur J. Collier and Frank L. Hess, of the Geological Survey, found a tin-bearing lode on Lost River, in the eastern part of the York district. Lode mining has been carried on to a greater or less extent ever since the first discovery. The earliest operations were carried on for several years at the Cape Mountain locality, considerable underground development work being done and a few small shipments made. The ground held by the company was then patented, and the property has since been idle. The Lost River mine had been under development in a small way for several years prior to 1913, when the more extensive operations under the present management were begun.

Stream tin has also been found in different parts of the Yukon basin—on Cleary and other creeks of the Fairbanks district in 1904, in the Circle and Hot Springs districts, probably, in 1908, and in the Ruby district in 1912. There has, however, been no commercial development in any of these fields except in the Hot Springs district.

"Practically all the tin produced in Alaska has been shipped abroad for reduction. The earlier shipments went mainly to Swansea, Wales, but lately a large part of the production has been sent to Singapore.

"The tin deposits of the York region have been investigated by a number of different parties of the Geological Survey. The most exhaustive studies are those contained in the earlier report of A. J. Collier and a later publication by Adolph Knopf.

"The growing importance of the tin-mining industry in Alaska led to a re-examination of part of the York district in 1914, and to a similar investigation of the tin deposits of the Hot Springs district. Only a brief time could be devoted to the work."

Mr. Eakin acknowledges the courteous hospitality shown to him by the residents of the districts visited, and the assistance in collecting data generally lent by the operators. Special acknowledgment is due, he says, to George Jamme, of Lost River and Seattle; Walter Johnson, of San Francisco, and Sylvester Howell, of Tofty.

BLACK HILLS REGION SUBJECT OF ELABORATE FOLIO

N. H. Darton and Sydney Paige are completing an elaborate folio of the northern Black Hills area, which includes Deadwood and Lead. The latter mining district contains the famous Homestake mine. The geology of this region is highly complicated. The folio is one of the most elaborate yet completed by the Survey.

Recent Patents of Interest to Mining

Lamp-Holding Attachment for Miners' Caps, No. 1168700. This invention is by Lovell M. Ashley, Jr., of Winona, W. Va., and relates to lamp holding attachments for miners' caps. The holder consists of a bracket, including laterally bent terminal portions adapted to be attached to the top and vizor of the cap, with a band slidably mounted on the intermediate portion of the bracket, with a means for locking the band against sliding movement and lamp holding arms carried by the band.

SINTERING

Method of Agglomerating Ores, No. 1166903, by Philip O. Harding, of Pittsburgh, Pa. This invention relates to the agglomerating of ore, particularly iron ore, a procedure commonly called sintering.

In the ordinary operation of blast furnaces there is a large amount of flue dust, which is rich in iron, but because of its finely divided condition is difficult to handle, and the recovery of its iron content has been found to be so costly that it has only been regarded as waste. The effort to recover the ore from the flue dust led to the sintering process.

It has been found a matter of great difficulty to obtain a uniform agglomeration and produce an article which does not contain pockets of unaltered and friable material.

This invention consists primarily in subjecting a body of material to be agglomerated to a progressive combustion, which advances through the body, causing the current of combustion-sustaining gas to flow to the region of combustion through that portion of the body which has already been subjected to the agglomerating fire, and at the same time effecting a breaking up of that portion of the body through which the combustion-sustaining gas is advancing. Such breaking up opens the pockets of unaltered material, and the current of air sweeps the material so exposed back into the region of combustion, where it will undergo ignition and agglomeration

The invention also consists of an apparatus for performing the operation above described.

ASSIGNED TO JEFFREY MFG. CO

Mine Cage No. 1168501, by Paul W. Holstein, of Columbus, Ohio, and assigned to the Jeffrey Manufacturing Company.

This invention relates to mine cages, and has for its special object to provide mechanism whereby a car can be run upon the cage at a landing and held more securely in position than heretofore while the cage is being lifted to the surface of the ground.

The cage comprises essentially two parts, the sling frame and the tilting platform pivotally secured to each other at their lower ends. A canopy is provided to protect workmen in the cage from falling bodies. This canopy is so hinged that it can be swung into a vertical position to permit the lowering down the shaft of rails, etc. This cage is equipped with a latch adapted to catch and hold in fixed position longitudinally an oncoming car, with skids adapted to support the car body, and a means for lowering the car until the car body rests upon the skids

---

DESULPHURIZING

Desulphurizing and Smelting Ores, No. 1,169,069, by Arthur S. Dwight, of New York, N. Y. This invention relates to improvements in processes for treating ores, particularly those which are susceptible of desulphurizing. The process consists of sintering and smelting ore initially in a fine condition, by continually forming a thin stream or layer of the ore, sintering the stream into a relatively strong and rigid sinter cake at a point relatively remote from the region of smelting, and continually moving the cake horizontally away from the region of the forward part of the cake into the region of smelting, subjecting it to smelting action. The invention also consists of an apparatus for ore treatment comprising a continually moving element, a means for depositing a continuous stream of ore on the element, with a means for causing the sintering of the ore by the action of heat into a continuous cake, and also a means for continually smelting the forward end of the advancing cake while the cake retains the heat of sintering.

CONCENTRATING PLANT

Means for Concentrating Ores, No. 1,167,638. By Thomas A. Edison, of Llewellyn Park, West Orange, N. J. The invention relates to improvements in means for concentrating ores, in which the ore constituents to be separated and separately collected are of different densities. The invention provides means for concentrating ores by a plurality of horizontally elongated, substantially level, endless tanks, the tanks being so arranged adjacent to each other that each tank, except one, surrounds an adjacent tank. It provides means for producing a uniform flow of liquid in a horizontal direction in portions of each of the tanks, and means for introducing ore into the uniformly flowing liquid in each tank, by which the ore constituents are separated and deposited according to their density by the action of gravity and the flowing liquid. It also provides means for collecting and removing ore constituents so deposited.

CONCENTRATION

Apparatus for Separating the Metallic and Rocky Constituents of Ores. No. 1,167,835. By Dudley H. Norris, of San Francisco, Cal. It relates to the concentration of metallic ores. The invention comprises an apparatus for separating the metallic and rocky constituents of ores, comprising means for introducing water containing air in solution into a flowing mixture of crushed ore and water at a number of different points along the path of travel of the mixture, so as to cause nascent bubbles of air to form continuously and rise to the surface, carrying off the metallic particles of ore.

ZINC ORE TREATMENT

Process of Recovering Zinc from its Ores. No. 1,167,701. By Frederick Laist and Frederick F. Frick, of Anaconda, Montana.

This invention relates to the hydrometallurgical treatment of zinc ores, and is specially adapted to the treatment of so-called complex sulphide ores which are not readily amenable to treatment by the usual process. The process consists of leaching the ore with an acid reagent, oxidizing the dissolved ferrous salt, purifying the solution by adding thereto an excess of calcine in presence of an agent capable of oxidizing ferrous iron, and electrolytically regenerating the oxidizing agent with simultaneous deposition of metallic zinc.

REDUCING IRON ORES

Process of Reducing Iron Ores and Other Metallic Oxids to the Metallic. · No. 1,167,016. By Emil Bruce Pratt, of Lakewood, Ohio

Mr Pratt claims to have found a process of reducing iron ore to metallic states, by heating the ores within a furnace to the necessary temperature in the presence of hydrogen as the reducing agent, excluding all oxidizing gases, and admitting to the furnace only such amounts of carbon as will give the reduced metal the desired amount of carbon, and regulating the temperature of all parts of the charge to cause the desired amount of silica in the ore and in the fluxing material to be reduced and as silicon to combine with the iron. The metal can then be withdrawn from the furnace in the desired condition.

ORE DRYING

Ore Drying Apparatus. No. 1,166,909. By John Q. A. Houghton, of Lowell, Vermont.

This invention relates to ore drying apparatus suitable also for drying other similar materials, in which the ore to be dried is contained in revoluble containers which are subjected to the action of heat. One of its objects is to provide a construction such that products of combustion may be carried from the fire box without contacting with the material being dried. Another object is to provide a feeding means by which the passage of the ore through the feeding chute to the feed box may be controlled, and also to provide means whereby the containers for drying the ore may be revolved.

AMALGAMATION

Combined Concentrating and Amalgamating Machine. No. 1,169,083. By Warren L. McLean, of San Francisco, Cal.

This invention relates to a combined concentrating and amalgamating machine. One of its objects is to produce a concentrator for handling gold-bearing sand, and particularly to separate the coarser gold by concentration and the fine gold by amalgamation. Another object is to produce an apparatus in the nature of a "knock-down" structure that may be readily taken apart for shipment and put together again by a person of ordinary ability, and to produce an apparatus that is simple in construction, efficient and durable in operation, and which is so arranged that the water may be reused, practically speaking, indefinitely.

Several new methods of increasing the supply of American potash have recently been brought to the attention of the Bureau of Foreign and Domestic Commerce, of the Department of Commerce. One of the most promising of these efforts to find a substitute for German fertilizers is a patent taken out a few weeks ago by a Canadian for a method of using the potash in ordinary feldspar.

The process is a simple one, consisting of heating the feldspar with limestone and iron oxide at a temperature of about 2,200° F., which produces a partly fused mass that is easily decomposed by a weak acid. From this product the potash salts can readily be extracted for further purification. The inventor has been in consultation with Dr. Norton, the expert who has been looking after the potash and dyestuff situations for the Bureau of Foreign and Domestic Commerce, and it seems very possible that greatly simplified method of transforming feldspar into fertilizer will soon be available.

Carborundum Materials

Carborundum refractory materials are manufactured only by the Carborundum Company, Niagara Falls, N. Y. Statistics can be obtained only from that company.

STANDARDIZATION OF MINE-ACCIDENT RECORD HAS BEEN BEGUN

Bureau of Mines Sends Out New Blanks Showing the Nature of the Report That is to be Made at the End of the Present Year—More Detailed Information Requested—Inaccuracies to be Eliminated

What is regarded by authorities as a long step forward in the matter of securing mine accident statistics has been taken by the Bureau of Mines. Information that will go more into detail and that will do away with certain inaccuracies will be called for at the end of the current year.

The Bureau has sent out to all operators of mines, coal and metal, the blanks which are to be used this year. This in itself has called forth much commendation. Too often information is asked at the end of the year which requires a great deal of additional labor to furnish. When the operators are aware at the beginning of the year just what they are going to be called upon to furnish, it is a matter of little inconvenience to arrange their records so that the matter may be kept day by day. At the end of the year it is then just a matter of entering the figures on the blanks the Government furnishes.

The new blanks will make possible the standardization of mine accident records throughout the country.

Fatality rates based on the number of men employed are not as accurate as they should be, because many of the men do not work full time, are not exposed to danger as long as others, and the calculated fatality and injury rates are too low. The rates should be based on the number of full-time men actually exposed to the dangers of the mine, and can be obtained only by recording the actual number of hours worked during the year, as shown on the payroll. The total number of hours for all men divided by 3,000 will give the actual number of 3,000-hour workers exposed to the hazard of the industry during the year. For this reason the form calls for total hours worked by all men during the year.

On the following form, for instance, the twenty-two items numbered are the same as have been requested from coal mine operators previously. Under each of these heads more detailed information is asked. The lettered items are new.

NUMBER KILLED UNDERGROUND

1. Falls of Roof (coal, rock, etc.):
(*a*) At working face.
(*b*) In room or chamber.
(*c*) On road, entry, or gangway.
(*d*) On slope.

2. Falls of Face or Pillar Coal:
(*a*) At working face.
(*b*) On road, entry, or gangway.

3. Mine Cars and Locomotives:
(*a*) Switching and spragging.
(*b*) Coupling cars.
(*c*) Falling from trips.
(*d*) Run over by car or motor.
(*e*) Caught between car and rib.
(*f*) Caught between car and roof while riding.
(*g*) Runaway car or trip.
(*h*) Miscellaneous.

4. Gas Explosions and Burning Gas:
(*a*) Due to open light.
(*b*) Due to electric arc.
(*c*) Due to blown-out shot.
(*d*) Due to explosions of powder.
(*e*) Miscellaneous.

5. Coal-Dust Explosions (including gas and dust combined):
(*a*) Due to open light.
(*b*) Due to electric arc.
(*c*) Due to blown-out shot.
(*d*) Due to explosions of powder.
(*e*) Miscellaneous.

6. Explosives:
(*a*) Handling and transportation.
(*b*) Caps, detonators, squibs, fuse.
(*c*) Thawing.
(*d*) Premature blast and short fuse.
(*e*) Charging and tamping.
(*f*) Blown-out or windy shot.
(*g*) Sparks from match, lamp, or candle.
(*h*) Returned too soon.
(*i*) Delayed blast.
(*j*) Shot breaking through rib or pillar.
(*k*) Suffocation by powder gas.
(*l*) Drilling into unexploded charges.
(*m*) Miscellaneous.

7. Suffocation from Mine Gases.

8. Electricity:
(*a*) Direct contact with trolley wire.
(*b*) Bar or tool striking trolley wire.
(*c*) Contact with mining machine.
(*d*) Contact with machine feed wire.
(*e*) Contact with haulage motor.
(*f*) Miscellaneous.

9. Animals.

10. Mining Machines (other than 8c).

11. Mine Fires (burned, suffocated, etc.).

12. Other causes:
(*a*) Fall of person.
(*b*) Machinery (other than 10).
(*c*) Rush of coal or gob.
(*d*) Falling timber.
(*e*) Suffocation in chutes.
(*f*) Miscellaneous.

NUMBER KILLED IN SHAFT

13. Falling Down Shafts or Slopes.
14. Objects Falling Down Shafts or Slopes.
15. Cages or Skips.
16. Other causes:
    - (a) Overwinding.
    - (b) Breaking of cables.
    - (c) Miscellaneous.

NUMBER KILLED ON SURFACE

17. Mine Cars and Mine Locomotives.
18. Electricity.
19. Machinery.
20. Boiler Explosions or Bursting Steam Pipes.
21. Railway Cars and Locomotives.
22. Other causes:
    - (a) Explosives.
    - (b) Fall of person.
    - (c) Falling objects.
    - (d) Suffocation in chute, bin, or culm.
    - (e) Miscellaneous.

INTERESTING POINTS BROUGHT OUT IN INCIDENTAL GEOLOGICAL FINDS

Radium deposits, the wearing away of the land by the sea, the make-up of the upper part of the earth's crust at various places, the development of mountain ranges, and the origin of dolomitic limestones are some of the subjects discussed in a volume recently published by the Geological Survey entitled "Shorter Contributions to General Geology, 1914." In former years the announcement of incidental discoveries made by geologists in connection with the study of their main problems has awaited the preparation of extended reports on those problems, but by a plan which has recently been put into operation by the United States Geological Survey such minor additions to the world's store of knowledge, even though unrelated, are now grouped together in one volume and published as promptly as possible.

Some of the conclusions in the volume which has just appeared are of interest to the general public; others will be appreciated only by those who have made a special study of geology. For example, the articles on the rock strata known to geologists as the "Montana group" describe the strata which make up that group and their variations from place to place and interpret the facts set forth, giving their significance as to the origin of the strata and the conditions under which they were formed. Most of the field evidence was obtained in examinations of public land for the purpose of determining its value as coal land.

Indirectly a thorough knoweldge of the strata makes the finding of coal and other valuable deposits easier, but the value of the work is not wholly expressible in dollars and cents, for in the realm of pure science the understanding of the make-up of the earth and its history in the past has a value entirely apart from what such knowledge may at present yield directly or indirectly in money.

An article on pitchblende ores of Colorado includes not only an account of those ores in that State, but also a brief description of the principal European occurrences of pitchblende, one of the ores of radium. An article on erosion in Chesapeake Bay prophesies that certain islands in the bay will be washed away by the waves within the next century and shows the places on the bottom of the bay to which the sand and soil of these islands is being carried by the waves and currents. Another article describes some lavas which have been thrust into cracks in the earth's crust in the vicinity of Spanish Peaks, Colo. Still another article shows that echinoderms, a class of sea animals, secrete skeletons of one kind of material in cold water and of another kind in warm water, and that the origin of magnesian or dolomitic limestone, which has long been a mystery, may be partly explained by the nature of these skeletons, myriads of which make up considerable parts of certain rocks. Several papers discuss the strata underlying the surface of the earth in various parts of the country and give data of use to the driller of deep wells.

CRUDE MOLYBDENITE MAY BE ADMITTED FREE OF DUTY

Molybdenite, freed from gangue, may be admitted to this country free of duty, according to a decision by the United States Court of Customs Appeals. In the case of Hampton, Jr., & Co. *versus* the United States the court repealed the decision in this case of the Board of General Appraisers. The decision of the court is summed up as follows:

1. Molybdenite, Mineral Substance, Crude.—Molybdenite, a mineral substance imported in its natural state as freed from the rock or gangue formation in which it is found by crushing the rock or gangue without crushing or changing the condition or formation of the mineral itself and then placing the whole in water when the mineral rises to the surface, and is skimmed off, is not dutiable under paragraph 81 of the tariff act of 1913 as a mineral substance partially manufactured, but is free of duty under paragraph 549 as a mineral not advanced in value or condition, etc.—Meyers *v.* United States (1 Ct. Cust. Appls., 506) distinguished.

2. Process Not Manufacturing Process.—It has been uniformly held in customs interpretation that the application of processes necessary to produce an article from its native condition and to bring it into a condition that it may be imported, without affecting its *per se* character, is not regarded either as a manufacturing process or as a process advancing it in value or condition.

Advertising Barred by Government

A regulation prevents the display of advertising matter in any Federal building. This accounts for the fact that many of the high class calendars which are sent out by mining and other companies, are not seen in the Government offices to which they are sent.

Traffic Developments of the Month

Reasonable Rates to Be Secured

In the case of G. B. Markle Company *vs.* Lehigh Valley Railroad Company in which complaint was made that rates applying upon anthracite coal in carloads from certain collieries in the Lehigh coal region of Pennsylvania to Perth Amboy f. o. b. vessels for transshipment are unreasonable and unjustly discriminatory; the commission held that:

1. Reasonable rates for the future will be secured complainants by the order entered in *Rates for Transportation of Anthracite Coal*, 35 I. C. C., 220.
2. Following *Plymouth Coal Co. vs. L. V. R. R. Co.*, 36 I. C. C., 140, defendant found to have justified its refusal to continue to furnish storage bins at Perth Amboy, N. J., for the free storage of anthracite coal, and defendant's demurrage regulations governing anthracite coal awaiting transshipment at Perth Amboy found reasonable.
3. Question of reparation held in abeyance for determination in a supplemental report.

Trim Down Coal Rates

In the case of Chas. W. Davis *vs.* Minneapolis, St. Paul & Sault Ste. Marie Railway Company, the rates charged for the transportation from Manistique, Mich., to Gladstone, Mich., of shipments of hard and soft coal, in carloads, originating in Pennsylvania and West Virginia were found to have been unreasonable to the extent that they exceeded rates of 75 and 50 cents per net ton, respectively. Rates of 75 cents on hard coal and 50 cents on soft coal were prescribed as maxima for the future. Reparation was awarded.

To Decide Reparation Issue Later

In the case of the Plymouth Coal Company *v.* Pennsylvania Railroad Company and against the Delaware, Lackawanna & Western Railroad Company in which complaint was made that rates applying upon anthracite coal in carloads from Plymouth and Luzerne, Pa., to South Amboy and Hoboken, N. J., f. o. b. vessels for transshipment are unreasonable, the Commission held:

1. Reasonable rates for the future will be secured complainants by the order entered in *Rates for Transportation of Anthracite Coal*, 35 I. C. C., 220.
2. Question of reparation held in abeyance for determination in a supplemental report.

Withdraw Import Rates

The proposed withdrawal of import rates on ferromanganese from eastern ports to central freight association territory was found to be justified by the Commission.

Will Order Refund

In the case of the National Petroleum Association *v.* Atchison, Topeka & Santa Fe Railway Company upon complaints that defendants have collected, or seek to collect, charges based on rates higher than their published rates applicable to petroleum tailings in carloads shipped from oil refineries in the State of Kansas, and from an oil refinery at Vinita, in the State of Oklahoma, to East St. Louis, Granite City, and Chicago, Ill., East Chicago and Gary, Ind., and Racine and Milwaukee, Wis., the Commission *Held*, That the published rates on petroleum tailings were lawfully applicable to the shipments involved and that refund of overcharges will be ordered on proper showing. Waiver of certain undercharges outstanding was authorized.

Fix Coal Rate

In the case of the Pitt Gas Coal Company *vs.* Pennsylvania Railroad Company, the Commission finds the present rate on coal from Besco, Pa., to Ashtabula Harbor, Ohio, and other lake ports in the State of Ohio, when for transshipment by vessels on the great lakes to points beyond, to be unreasonable to the extent that it exceeds 78 cents per net ton. The southern boundary of the Pittsburgh district is changed to include Besco.

Increase Not Allowed

The proposed increased rates on bituminous lump coal in carloads from mines in Colorado and Wyoming to destinations in Nebraska and Colorado on the lines of the Union Pacific Railroad was not justified.

Joint Rates Upheld

In the matter of coal to Kentucky points, the proposed cancellation of joint rates from points in West Virginia to points in Kentucky is not justified by the Interstate Commerce Commission.

Must Continue Through Rates

The proposed cancellation of joint rates which would result in increased rates on coal from Toluca, Ill., to interstate points on the Chicago, Milwaukee & St. Paul Railway were found not justified.

Reparation Granted

Reparation has been allowed by the Commission in the following cases:

Prime Western Spelter Co. *vs.* Vandalia Railroad Co., unreasonable charges on thirty-one carloads zinc ore.

UNCLE SAM is conducting a multitude of activities which have a bearing on mining. Men engaged in this industry cannot afford to be out of touch with this work.

The Mining Congress Journal, the official organ of the American Mining Congress, is covering the Washington field carefully in its news columns. It offers a ready means of keeping you informed as to the efforts the Government is making in your behalf.

It is important not to forget that matters develop in the capital which menace your best interest. It is advantageous to know of these things in time to counteract them.

The Mining Congress Journal covers Congress, the Bureau of Mines, the Geological Survey, the Interstate Commerce Commission, the Supreme Court, the Land Office, the Patent Office, the Department of Labor and the other Federal offices where the work affects the mine owner or operator. State mining legislation and current decisions are featured. There are many other interesting features as to mines in the Journal.

Can you afford to be without this service?

TESTS OF BUREAU OF MINES EXPLODE ESTABLISHED THEORY

A coal dust with a high percentage of moisture is not necessarily inexplodable, though it has been frequently asserted that it is. The tests of the United States Bureau of Mines have shown that a certain coal dust from Utah with nearly 15 per cent of moisture will explode with a rise in pressure far greater than that obtained on exploding some of the coal dusts of West Virginia containing less than 1 per cent of moisture. The water in the Utah coal does not appear to make it safe. That, at least, is the testimony of experiments on a laboratory scale.

In the Utah coal mentioned there is much volatile matter, but in that from West Virginia far less, and the great quantity of bituminous matter in the first coal appears to overcome the immunity from inflammation which might otherwise result from the presence of uncombined moisture.

But all immature coals contain not only much water, but also much volatile matter, so it is not safe to suggest that immature coals are safe; and, on the other hand, there is abundant evidence that while mature coals are not easily inflammable in laboratory experiments and do not generate high pressures, yet in actual tests, when dusts are detonated, the dusts from such mature coal can produce most disastrous effects; for, being able to generate the maximum heat, they assure the greatest possible expansion and the highest pressures.

The safety of Montana coal mines from explosions has been ascribed to the presence of moisture in the coal, and it is true that the water content of the samples of coal that have been investigated is high, while inflammability is abnormally low. But, while the moisture is possibly a cause, it is not the sole reason for the safety of the dust. Apparently its nonfriability is not an important cause either, for even when ground fine for inflammability tests the dust generates little pressure on inflammation by an electric current.

The two Montana dusts tested by the Bureau of Mines were reasonably low in ash, and there is not a hint of the reason why they should be so resistant to inflammation. Until more is known and until the value of the tests of inflammation as a true index of explosability is proved, experts are inclined to admit they do not know why one dust explodes with ease and violence and another dust with difficulty and without energy.

As further evidence of the explosibility of substances containing moisture it may be added that no difficulty has been found in exploding the dusts of grain, by intention or by accident. These dusts all appear to contain from 6 to 10 per cent of moisture, and some also as much as 16 per cent of ash. But these impurities do not prevent such dusts from the sudden propagation of flame.

THE
MINING CONGRESS
JOURNAL

Published Each Month by
THE AMERICAN MINING CONGRESS.
Munsey Building. Washington, D. C.

Subscription Rate, per year	$2.00
Single Copies	.20

Entered as Second Class Matter January 30, 1915, at the Postoffice at Washington, D. C.

FEBRUARY, 1916

EDITORIALS

DROP LINCOLN'S POLICY; AN EXPERIMENT BEGUN

Abraham Lincoln laid down the principle of the public-land policy under which the West has been developed, in his memorable statement:

"The public lands are an impermanent national possession held in trust for the maturing States."

The liberal policy founded on that principle continued for a period of forty years without serious question as to its advisability. Occasionally a lone critic voiced the sentiment that all the people should profit by the enhanced value of property brought about by increasing population. Reference was made to the fact that Manhattan Island, purchased in 1631 for $24, had grown to an assessed valuation of more than four billion dollars. The belief was expressed that this immense increase in value should have benefited the whole people rather than those who were fortunate enough to be its owners.

After forty years had passed this idea, based upon accusations of fraud and dishonesty, commanded so much attention that in the year 1906 an order was issued by the President withdrawing thousands of acres of mineral lands from entry and settlement. This order served to prevent acceptance of filings upon the mineral lands withdrawn, and to make more difficult the securing of patents by those who had applied for them.

A perfectly fair, safe principle is being abandoned and an experiment that threatens the welfare of millions is to be tried in spite of determined protests.

VALUE OF LIBERAL LAND POLICY PROVEN CLEARLY

Practically four-fifths of the area of the United States was obtained at a cost to the Government of a trifle over $76,000,000. Since that time the Government has received for such of its lands as have been sold the sum of $474,477,393.81. In addition to having received an amount six times greater than the amount paid, large areas have been donated for military service and for educational purposes; more than 80,000,000 acres of land have been donated to railroad corporations to encourage railroad construction, and the Government still retains the ownership of approximately 450,000,000 acres of land. The result by itself seems to be ample justification for the liberal land policies which have controlled during the greater part of the nation's history. The most notable result, however, is the marvelous industrial growth which has obtained as a result of this liberal policy.

LABOR DEPARTMENT NO PLACE FOR MINES BUREAU

It is difficult to understand the motives of certain labor interests in their continued agitation to have the Bureau of Mines transferred from the Interior Department to the Department of Labor. Several bills have been introduced at this session of Congress looking to this end. One measure goes so far as to provide for the bodily transfer of the Bureau to the Department of Labor. Other bills provide for the change in jurisdiction over certain matters now being handled by the Bureau of Mines.

The Department of Labor does not pretend to be an agent of capital, or of the employer. Louis Post, the assistant secretary of the Department, in explaining to a representative of this publication just what his Department represents, said it is "the State Department of Labor." Just as the State Department of the United States, just as the foreign offices of the European governments, contend for the rights of their nationals, so does the Department of Labor work in the interest of employes. Whether it is right to give one class of the citizenry representation on the cabinet without giving others equal representation is another question and one not pertinent to this editorial. With this understanding of the function of the Department of Labor is it fair to try to put the Bureau of Mines, an activity having as much to do with the employers as with the employes, under its direction?

The Bureau of Mines has nothing to do with the investigation of labor problems. It is a scientific bureau conducting researches into various aspects of mining that are of interest to capital and labor alike. Its work only can be successful with the hearty cooperation of mine owners. Despite the generosity and the broadmindedness of mine operators in general, it is a very natural conclusion that they would lose some of their enthusiasm for this cooperation if the work were turned over to the Department of Labor.

A bill providing for the transfer of the Bureau of Mines to the Department of Labor is not regarded seriously. Such a step would be too radical. There is menace to the mine safety work, however, in the transfer which was proposed. Little additions made quietly here and there to the jurisdiction of the Department of Labor may continue until one of the interests concerned in the industrial upbuilding of the nation may have a considerable proportion of the administrative machinery under its direction. The evils in having any of this machinery in the hands of partisans are many. Some of them we have discussed. We will go into this question deeper at another time. Just at this time, however, the American Mining Congress is particularly interested in calling attention to insiduous activities of some who would ruin the remarkable prospect for good to the mining industry in the activities of the Bureau of Mines under the jurisdiction of the Interior Department.

THE WATER POWER BILL

The bill for control of water power upon the public domain, H. R. 408, as passed by the House of Representatives, has been amended by the Senate Committee on Public Lands, by the substitution of a bill eliminating very many of the objectionable features in the bill, as passed by the House.

Perhaps the Senate bill, as drawn, is as nearly satisfactory as any bill can be which will serve the purpose of the advocates of this system. During the years of Western development, rights of way over the public domain for public uses have been granted without question. The provision for acquiring such right should be not less onerous than those required to secure rights of way for public uses over privately owned property.

Under the new system, the right to secure government-owned property for public utilities is entirely abrogated, and the government title held to be sacred, as against the right of the public in the creation of public utilities.

The title to privately owned land, whether in the East or West, is always held subject to the broader right of the public, under the eminent domain acts to condemn rights for public uses upon the payment of its reasonable value to be fixed by a jury. It frequently has been held that the title of the government in its public lands is that of a landlord, and not of a sovereign. If this principle is accepted, it would seem that government-owned land can be condemned for public uses under the laws of any State in which the land is situated. The denial of the right to develop such utilities as will serve the public good will likely lead to a bitter contest to determine the question as to whether the rights of the government are more sacred than the rights of individuals who hold their title by patent from the government.

WISHES OF WEST ARE THWARTED IN CONGRESS

Revision of the mining laws of the United States was placed considerably further in the future last month by the refusal of the Mines and Mining Committee of the House to report favorably on either of the bills providing for an investigating commission. The wishes of the metal mining States were disregarded.

There are many reasons why one of the chief industries of the nation is treated so inconsiderately. Lack of cooperation among mining men themselves is the chief cause. They had no way of making it absolutely clear that they are a unit on this question. Another important cause is the existence in Congress of the present dangerous committee system. The Mines and Mining Committee members, with one exception, have no first-hand knowledge of metal mining. In the rush of other duties, they have not time to go deeply into intricate technical questions. Their constituents are not interested in laws governing metal mining. Any work their Representative may do on the Mines and Mining Committee will gain him no favor among those who will pass on his re-election. They have interests, however, that must be attended to or a change in Representatives will be likely. The natural course is that such a committee will reach decisions without delving into the matter sufficiently deep to insure correct judgment.

Before a committee of this kind a clever argument like that presented by the Alaskan delegate, is very likely to be successful. The majority of the committee accepted various arguments of Judge Wickersham's which were based on faulty premises. They did not have the knowledge of conditions to discover the errors of the opponent of revision. Just one voting member of the committee lives west of the Mississippi River.

Judge Wickersham's argument undoubtedly was the direct cause of the failure of the committee to report Senator Smoot's bill favorably, his main argument being that the big smelter and copper interests alone want the mining laws revised.

This defeat may rouse Western miners. The metal mining interests have been working too long handicapped by a ball and chain. The mining laws are archaic. They are depressing the industry. They should be revised. There is just one way to secure it. Those interested directly and indirectly in mining must get behind this effort.

SAFETY-FIRST WEEK SHOULD BE MADE PERMANENT

This month Washington is to be the scene of a great safety-first exposition. The Bureaus of the Federal Government interested directly in the conservation of life and health will have exhibits which will give a graphic impression of the work in which they are engaged. There also will be a convention of State mine inspectors. The exhibits will be on display for a week and the Bureau of Mines is referring to it as "safety-first" week.

We commend this happy thought. We will go one step farther and suggest that safety-first week be made an annual event. We believe that one week a year can be set apart for exhibits of the kind being planned for this year and for the meeting in Washington of State officials having charge of the various activities related to mining and the conservation of life.

There is nothing so instructive as conventions. They are the occasion of systematic discussion of subjects of greatest interest in an industry. Text books naturally cannot be kept current. The latest thought and the most improved practice is brought out by those who address conventions. It is probable, however, that this advantage must be placed second to the profit that comes from the interchange of views by those who attend. Mine inspectors, for instance, from various States get together. Naturally they talk "shop." Each points out the specific points in his work that he thinks is likely to be most instructive to his colleagues.

The Federal Government is in a position where this safety-first week can be made a great success. The American Mining Congress will lose no opportunity at the meetings that will be held this month and afterwards to urge that safety-first week be made an annual feature of the work being conducted by this Government in the interest of the conservation of human life.

TARIFF COMMISSION PLAN WILL APPEAL TO MANY

Senator Owen's plan for a permanent tariff commission, with authority in the President within maximum and minimum limitations to use the flexible rate in the encouragement of foreign trade relations, will commend itself to the former advocates of reciprocity. Senator Owen sums up his reasons as follows:

> First. To enable the Executive Department, every Member of the House of Representatives and of the Senate, and to enable the American people to know the truth with regard to the factors entering into the cost of production and distribution of articles entering our foreign commerce and our domestic commerce.
>
> No Member of Congress can perform his ordinary duties and at the same time keep up authoritatively with the 4,000 items on the tariff schedule. It is not humanly possible. Most of the evidence submitted in Congressional committee hearings on the tariff is biased, or partial truth and partial falsehood mixed, and is usually misleading.
>
> Second. This knowledge is necessary to enable Congress, and to enable the Executive Department, to protect American commerce against unfair practices from abroad, such as selling goods below cost for the purpose of breaking down American business enterprises by unfair competitive war, and thereafter obtaining a monopoly of that line.
>
> Third. From the standpoint of those who believe America might be injured by the so-called dumping of foreign goods on this market, such information is essential to safeguard our commerce.
>
> Fourth. From the standpoint of those who believe in reciprocal agreements for the purpose of promoting our foreign commerce, such information is vitally necessary.
>
> Fifth. From the standpoint of those who do not believe in the protective tariff, as understood by the Republicans, but do believe in adjusting a revenue tariff to increase the revenues, and at the same time give a justified incidental protection, such information is necessary.
>
> Finally, as a matter of course, those who believe in a protective tariff would naturally concede that this information is vitally necessary to enable the tariff schedules to be judiciously framed.

Senator Owen's "Justified incidental protection" seems to describe with reasonable accuracy the demand of the advocates of protection. A duty which covers "the difference in cost of production here and abroad as measured by the difference in the cost of the labor involved" would seem to be a "justified incidental protection."

So long as Mexico shall pursue its various revolutions the lead and zinc producers of America can well get along without tariff protection. When Mexico shall again restore order the zinc producer of the Joplin District will not be able to mine 3 per cent zinc ore with $3.50 labor in competition with Mexican 40 per cent ore with $.75 labor. This situation is facing the American zinc and lead producers to whom a "justified incidental protection" will be vehemently welcomed in place of the present tariff duties on these items.

(Continued from page 58)

upon which a new decision must be made. But because there is litigation under these laws is no reason why there should be a revision of the laws. It is a good reason why there should not be a revision. But if it is a reason why there should be a revision, let us start in on the Ten Commandments. God knows there has been more litigation arising over the Ten Commandments or the principles involved therein than all other laws that were ever written by man. We might include them in this revision, because of the extensive litigation which has arisen from their violation.

There is and always was and always will be litigation in respect to all of our property rights. There is no property right either in the East or West which is not frequently involved in litigation, and our courts are full of it all the time. And the more we legislate, the more we turn our revision over to unrestrained commissions who are not responsible to the public for their revision, the more litigation there will be.

Now, let us talk for a few minutes on the subject of the United States mining laws. We have here a bill for the revision of the United States mining laws. What are the United States mining laws? How many of this committee have gone over the United States mineral-land laws and mining laws to discover what we are talking about? Is it a big body of law or a small one? What is it that we are talking about? Here are two volumes, consisting of the Bureau of Mines compilation of the United States mining laws, prepared here in Washington and annotated under the guidance of Judge Thompson in the Bureau of Mines. I have examined these volumes very carefully, and I am very greatly delighted with them. It is a fine work, and I want to call it particularly to the attention of this committee, and then I wish to call the attention of the committee to Judge Thompson's opinion with respect to the bill before this committee.

It is argued here that this is an involved and complex code; that it is something that you gentlemen of this committee can not understand. Why, my friend, Mr. Callbreath, intimated very strongly that this committee could not do anything with these laws; that it was not able to grasp the situation; that it was not capable of judging in matters of this kind, and therefore it would have to abdicate its power and pass it on to this commission provided for in the bill under consideration. Well, now, let us see if that is true. Let us see if we cannot understand these matters, and if, with the assistance of such a man as Judge Thompson, we cannot reach the same conclusions that Senator Thomas reached, that we do not need any commission; that we can do it ourselves, and do it much more to the satisfaction of the country than a commission.

AS TO THE PERSONNEL

Suppose you pass this bill. Suppose the bill passed tomorrow; who is going to be appointed on this commission? Of course the Representatives who introduced these bills in the House and Senate will say, "We don't know; the President is going to appoint them." But these gentlemen who have been here lobbying for the bill do not think that they are in the dark so much about it. They think they know who is going to be appointed on this commission, and there is no question but what they are very much interested in that feature of the project.

I will give you some information about these gentlemen who seem to be greatly interested in the appointments.

The other day I called the attention of the committee to some of the letters these society officials are writing to us. They are all nice men—they write nice letters; it is a great pleasure to receive them, and I have enjoyed them so much that I have kept them pasted in this little book. They come from Mr. Sharpless, secretary of the Mining and Metallurgical Society of America. Mr. Sharpless's address is 52 Broadway, New York, and, as we look a little closer into their business connections and addresses, you will discover there is quite a colony of them around 52 Broadway, New York, interested in this bill; and I do not want that Broadway bunch to mine the miners in Alaska, even if they do mine the miners in Colorado.

Now, Mr. Sharpless may have been west of the Missouri River, but I doubt it. He is the agent in New York, at 52 Broadway, for a mining company in London, engaged in selling stocks, I imagine from the title—although I do not have any very clear description of the character of their business.

The miners in the West know these mining experts so well that they have a familiar saying out there in criticism of mining witnesses; it is: "Some are liars; some are damn liars; and some are mining experts." Their condemnation continues to get worse as you go along the list. That is what people out there think of them, and I don't want any of them on this commission, and that is where this bill is headed for.

AS TO MR. WINCHELL

I want now to talk to you for a minute about who they are. Here is the report of the committee on the revision of the mining laws appointed by the Mining and Metallurgical Society of America. It is the basis of this whole scheme of these commission bills, and is signed by H. V. Winchell, chairman; C. W. Goodale, and M. L. Requa. They are the men who were the original discoverers of this idea, so far as the record goes, of having this revision done. Now, who are they? Who is Mr. Winchell? He is a fine man; I am not going to say anything against Mr. Winchell's character, for I have no doubt he is a good man. I have no doubt he is a member of the church and that he attends to his duties of that kind a good deal better than I do, and he certainly stands high in the mining world, because he represents the Amalgamated Copper Co. and has for many years. Horace Vaughn Winchell, mining engineer, Minneapolis, Minn.; first, he is chairman of the committee on mining of the Mining and Metallurgical Society of America, and made these reports which I have been reading from this document on the subject of this commission bill. Second, he is a member of the American Mining Congress and a member of the committee of that congress on the revision of the mining laws of the United States, which committee is also ably represented here urging this commission bill. Third, he is the geologist—or was for many years—of the Anaconda Copper Mining Co., and is now and has been since 1906 the consulting geologist for the Amalgamated Copper Co. These statements about Mr. Winchell's employment by the Amalgamated Copper Co. are taken from "Who's Who in America," 1914-15, which biographical sketch I assume was prepared by Mr. Winchell himself. I am not saying anything against Mr. Winchell except I do not want him on this commission.

Mr. C. W. Goodale is the second man on this committee of three. He is on the committee on mining laws, appointed by the Mining and Metallurgical Society, and was the manager of the Anaconda Copper Co., etc. For his biography on these matters see "Who's Who in America," 1914-15, page 924; "Who's Who on the Pacific Coast," 1913. Documents of that kind point out fairly whom these gentlemen represent, and are prepared by themselves.

Now, Mr. M. L. Requa is another good man. Mr. Requa developed the Nevada Consolidated Copper Co., and built the Nevada Northern Railway in Nevada, and represented that part of the Guggenheim Copper Trust.

These three are the men who are doing the business, and they represent the Amalgamated Copper Co. and the American Smelting & Refining Co., one or the other—the Copper Trust.

ENLARGE COMMITTEE

Fearing that somebody might raise a question about them all representing one big copper trust, they concluded to enlarge the committee, and on February 19, 1915, after all these reports were made, the committee was increased so as to take off the curse. At the meeting of the council on February 19, 1915, the president was authorized to increase the membership, and the committee on mining law was enlarged by the addition of Messrs. Seeley W. Mudd, Albert Burch, John W. Finch, and Franklin W. Smith.

Seeley W. Mudd is a director in the Ray Consolidated Copper Co., Ray, Ariz., and is a member of the executive committee of the Ray Consolidated Copper Co., Ray, Ariz., and the Ray Consolidated Copper Co. is a subsidiary and connected with the American Smelting & Refining Co.

Mr. W. R. Ingalls also appeared as a voluntary witness. He is president of the Mining and Metallurgical Society. Mr. Ingalls is a nice gentleman. You all saw him, and realized that at once. His address is 505 Pearl Street, New York, and he is editor of *The Mineral Industry*, and president of the Mining and Metallurgical Society of America. But what he knows about mining law or why he ought to be on any commission for the revision of the United States mineral-land laws is something I cannot find out.

Mr. J. Park Channing, who appeared here, has his office at 42 Broadway. Forty-two Broadway—that is the Amalgamated Co.'s office, isn't it? Now, we will just find out. It just struck me that is the Amalgamated Copper Co.'s number. Here it is in Poor's Manual of Industrials, 1915—yes, New York office, 42 Broadway. He is a little close to the Amalgamated—just a little too close to put him on a commission to revise the mineral land laws in Alaska. He is also a director in the General Development Co. and the Miami Copper Co. In other words, he is a copper man, and has his office at the same number on Broadway with the Amalgamated, and being in the copper business and at the same number he ought not to be on this commission, and this committee ought not to fool away very much time listening to him.

I will turn back now just a moment. I have given you what I can find out—just briefly what I have found out about this committee on mining law of the Mining and Metallurgical Society that made these reports we are considering in support of the bill before the committee.

REVISION OF LAWS MEETING

Now, here are some documents they sent to me, and I suppose to all of you, when this meeting of the Mining and Metallurgical Society of America, the American Mining Congress, and the American Institute of Mining Engineers was held in Washington, December 16—last month. I will read a little from this document. Here is what they say about the object of the meeting in Washington on December 16—last month:

> First. To urge upon Congress the necessity of modifying the existing United States land laws as they affect mineral locations.
>
> Second. To urge the appointment of a Government commission whose business it shall be to investigate by every means possible questions and interests involved and make recommendations as a basis for proposed mining law revisions.

Now, that was the object of that meeting. That was the purpose that brought that group of Copper Trust lobbyists to Washington and before this committee. And on this side of this same sheet is the program and list of speakers—look at it a moment.

At the first or morning session the president of the American Mining Congress was in the chair. At the second or afternoon session the president of the American Institute of Mining Engineers was in the chair, and at the evening session the president of the Mining and Metallurgical Society was in the chair, and down below is the list of speakers. I will not read the Members of Congress and Senators on that list of speakers, because I do not think they are in very good company, and I do not want their names in this record.

The first man on the list of speakers is John Hays Hammond. He has for many years been the Guggenheim agent in the examination of their great copper properties, and he is part and parcel of the American Smelting & Refining Co. now, just as much as Daniel of the House of Guggenheim is, and everybody knows it. "Who's

Who in America," 1914-15, page 1017; office, 71 Broadway, New York.

The next is J. Parke Channing, whom you saw on the stand and who hails from 42 Broadway, New York—the Amalgamated Copper Co.'s member.

Next is Mr. Horace V. Winchell, whom you now know as the special representative of the Amalgamated.

The next is Mr. Edmund C. Kirby, mining engineer and metallurgist of 918 Security Building, St. Louis, Mo.

Then comes Sidney J. Jennings. Now, Mr. Sidney J. Jennings is a director in the Tennessee Copper Co., as you will see on page 2567, Poor's Manual of Industrials, 1915. Mr. Jennings is a director in the Tennessee Copper Co.

AS TO MR. SAUNDERS

Then Mr. W. L. Saunders appears. He is the president of the American Institute of Mining Engineers, and one of the speakers. He is also a director in the International Harvester Co. see Poor's Manual of Industrials, 1915, page 388. Now, why a man who is a director in the International Harvester Trust should be taking such a deep interest in the revision of the United States mineral-land laws in the West, you can guess as well as I can. The fiscal agent of that company is J. P. Morgan & Co., one of the partners in the Alaska Syndicate and Guggenheim Copper Trust.

Now, those are the gentlemen who have appeared before this committee in person or by record, and who are at the bottom of this whole proposition of getting this commission appointed. They all represent in some fair degree either the Amalgamated or the American Smelting & Refining Co. They are so close to that interest that if they do represent anything in the way of mining revision they represent the Copper Trust and little else, and I do not want them on a commission to revise the United States mining-land laws for Alaska, and I do not want their advice on any subject relating thereto. Of course, if any mining bill is pending before this committee if they come in and state honestly what they do represent—that they represent the Amalgamated or the American Smelting & Refining Co.—I would give them a more careful hearing than I would if they came here pretending to represent something else. They have a right to be heard, but they have no right in advance of a public hearing on a pending bill to be suggesting to this committee what this committee shall do, or what laws we shall pass for the revision of the United States mineral-land laws in the West.

MAKES COMPARISON

Following Judge Wickersham's remarks Mr. Callbreath said:

Had Judge Wickersham been the Delegate from Alaska at the time I referred to in my previous statement there would have been a very different condition prevailing so far as Alaskan coal claims are concerned. And I say now that in my judgment if Congress at that time, undertaking to legislate for the opening of the Alaskan coal fields had appointed a commission at an expense of $25,000 and sent it to Alaska, and they had come back here with a full understanding of the situation and had suggested to Congress laws for the opening of those coal lands, that Alaska today instead of having a white population of 32,000 or 33,000 people would have a population of half a million people; instead of paying to the Federal Government $30,000 a year in revenue taxes, it would be paying to the Federal Government half a million dollars annual revenue taxes. I say that to meet these problems in an intelligent way, based upon the experience of the men who understand the situation, is a good business proposition for the Federal Government. To say now that we may undertake to amend these laws in Washington without investigating the conditions upon the ground, in my judgment is a thing that cannot be effectively done.

Particular stress has been laid upon three particular amendments which have been urged by certain individuals before this committee. Those same individuals are questioned as to their motives, and it seems, so far as the statement to the committee is concerned, that these are the men who began this movement. I want to say that the American Mining Congress—and if you will read the records of the American Mining Congress, particularly the proceedings of the Denver convention and the official calls of our various conventions, you will never think of such a thing as connecting the American Mining Congress with the American Smelting & Refining Co. They had nothing to do with this movement looking to a revision of the land laws, and the work was begun by our organization long before the Mining and Metallurgical Society was created, and we have been pressing along in a steady manner, continually asking for action of this sort. Mr. Kirby, who is at the head of our committee, is the man who devised this plan, the man who has been continually agitating it before the Mining and Metallurgical Society was created and before the gentlemen who appeared before the committee had anything to do with this movement.

PROSPECTORS CAN'T COME

It is said that you may bring before the committee, when you undertake to revise these laws, the men who will tell you how it should be done. Who will be the men to come before the committee? The gentlemen who have been questioned as being interested in these big mining companies. They are the only people who can come. Do you expect the prospector from Alaska or Colorado to come here? It has been said there are no prospectors in Colorado. That is not strictly true.

This movement did not start in Alaska. It started from people who feel the pinch of the situation and who need a law which would meet the requirements of their work. The points that have been brought before this committee are only as one to fifteen of the things in the mining law that need revision.

I have given the subject a good deal of thought and I would not think of such a thing as undertaking to frame a law to present to you gentlemen which I believed would meet the situation until I had gone upon the ground and examined the particular situation which is to be met. And I do not believe that you can accomplish it in any other way.

MAKES PLEA FOR MINERS

Now, let us reach this from a practical standpoint. A bill has been passed by the Senate. That is the Senate's view, and we will hardly expect the Senate to reverse its course. If we go along with them, we will accomplish something. If we undertake a new course, there will be a division and nothing will be accomplished; therefore if you want to help the mining industry of the West, give them what they ask for, and do not refuse them that service because at the last minute some other gentlemen who are criticised have come in here and espoused the cause. That is no reason why the practical mining men of the West who have been asking for this for years should be set aside and given a stone.

Congress is not bound by this commission, but you gentlemen who admit that you do not understand those conditions can send out your agents who will come back and tell you just what the conditions are which you are to meet by legislative enactment. It is a simple proposition, and if you pursue that course I believe you will accomplish something. I fear that if you pursue any other course nothing will be done, and I trust this committee will very seriously consider this question.

As to who shall be members of this commission, I have no choice. Make it three lawyers or leave the selection entirely to the President. I am satisfied they will bring facts to your attention which will enable you to get at the real truth of just what should be done. I do not think that it can be accomplished in any other way.

SENATOR SMOOT'S VIEWS

Senator Smoot explained that he worked for ten years to secure amendments to the mining laws. After this long trial to obtain piecemeal revision, he decided, along with the House committee, that a complete revision would be necessary.

Before introducing his bill in this session of Congress, he conferred with the heads of the American Mining Congress and the Mining and Metallurgical Society, Senator Smoot said. They, as well as all others directly interested, approved the bill, and it was introduced and passed by the Senate.

In his testimony Senator Smoot declared emphatically that a subcommittee of Congress could not gather the information necessary for an effective revision of the mining laws.

With regard to Judge Wickersham's fear that the report of a commission will be an entering wedge to the mining of the minerals of the country under lease, Senator Smoot declared that if such a danger existed in the slightest degree, he would oppose a commission vigorously; but there is no ground for any such outcome of a commission's report, he holds. Incidentally, Senator Smoot told of some of the remarkable achievements of the Utah Copper Company.

Both Senator Smoot and Representative Taylor criticised Judge Wickersham for his fight against the appointment of a commission. They called attention to how they have acted on his advice in regard to Alaskan legislation, because they feel that he is in a better position to reflect public sentiment than are they who have not been on the ground. Applying the same reasoning to the mining States of the West they did not disguise the fact that they consider Judge Wickersham unduly officious in his efforts against the commission proposal.

Mr. Taylor said to Judge Wickersham at the hearing: "Nobody but you is opposed to this measure. There isn't anyone from the seventeen western mining States who does not want this bill to pass."

Senator Smoot declared that there are not ten men in the States affected who are not anxious that the commission investigate before any attempt was made to revise the mining laws.

During the session of the committee Representative London, the only Socialist member of Congress, lost no opportunity to request that a representative of organized labor be on the commission. His activities finally called forth this from Representative Dennison: "I think, Mr. London, you are laboring under a misapprehension. This is not legislation to codify laws affecting the relations of employer and employe. If it were we would consider your suggestion." Mr. London insisted, however, that in revising the laws that it should go into the matter of safety devices and other matters affecting the men.

"The mining interests of the West feel as if they have been treated as a kind of stepchild," said Representative Taylor. "They feel that Congress has given them no attention for forty years. If we would send a commission out and meet these people and talk to them, it would let that country feel as if they had had a hearing. It would show them that their wishes are being considered, and when the commission came back and reported the sentiment of these mining States and mining camps it would certainly tend to crystallize public sentiment, and it would add to the weight of their report. The people out there would feel as though they were being consulted."

DIRECTOR MANNING URGES REVISION OF MINING CODE

The Director of the Bureau of Mines, Van H. Manning, had some interesting things to say before the House Committee on Mines and Mining last month. Some extracts from his remarks follow:

The Bureau of Mines is criticized for being largely responsible for a good many of the conservation bills introduced in Congress, but it has been my idea, and it was also the idea of my predecessor, Dr. Holmes, to convince the mining industry that the Bureau of Mines is not a bureaucratic organization. We want to cooperate with the operators and mining engineers in a way which will secure the best results for the work of all of us.

Agitation for revision of the mining land laws of the United States has been going on in the mining industry for a good many years. During the Roosevelt administration a commission was appointed by the President of the United States to report upon this subject. The report of the majority of that commission, which consisted of distinguished mining engineers and lawyers, is understood to be to the effect that the mining laws should be revised. However, the report of this commission was never published.

Since then, however, action has been taken by the several associations of mining engineers and mine operators of the United States, in most cases after prolonged consideration and debate. The Mining and Metallurgical Society of America, the American Institute of Mining Engineers, and the American Mining Congress—the three national organizations—have expressed themselves to the effect that the mining laws of the United States ought to be revised and coordinated in whole, and that a commission shall be appointed to recommend to Congress a new and workable code. Similar action has been taken by the several State mining societies of the country. On December 16, 1915, representatives of these organizations, and of American mine operators generally, to the number of 125, met in Washington and expressed themselves to the same effect. The mining press of the country, moreover, is in favor of this movement. In fact, there is a singular unanimity of opinion in the mining industry that the laws under which mining lands in the public-land States have been located and developed during the last forty-five years are in many respects unsatisfactory and pernicious.

Both the present Secretary of the Interior, Mr. Lane, and his predecessor, Mr. Fisher, called attention to the utter inadequacy of various features of the existing mining laws and to the need of revision.

The extralateral rights feature of the law of 1872 came to be regarded as so impracticable and so provocative of litigation that in every great mining district of the United States it has been nullified by common consent, or else by one great company buying out all conflicting interests. At Eureka, Nev.; at Leadville, Colo.; at Bisbee, Clifton-Morenci, and at Miami, Ariz., the apex law of 1872 has been discarded by common consent, each mining company operating within those districts confining itself to the ground comprised within its surface lines extended down vertically. At Butte, Mont., an extraordinarily costly litigation was terminated by the Anaconda Copper Mining Co. buying out the concerns with which it was in conflict and acquiring practically a monopoly of the mountain containing the great veins of Butte. The less important mining districts of the Rocky Mountain region have experienced a similar history.

It can be said fairly that the extralateral right provision has contributed far more to litigation than to economical mining.

At the present time there is no expert in the exploitation of mines and no expert in the practice of mining law who is capable of writing a new law which would adequately meet all of the conditions that have developed in the modern science of ore deposits and mining. Before a satisfactory law can be written it is necessary that there be an exhaustive study of the whole question. Why do not the mining societies themselves undertake this and tell Congress specifically what they want? They say that they do not do so for the reason that they consider the investigation that is necessary to be so onerous a task, involving the expenditure of all the time of a committee for so long a period, that it is beyond their means. Moreover, they are of the opinion that such a committee should visit all of the important mining regions of the United States in order to hear directly just what mining men in all parts of the country think is needed in the way of revision and change. Such a committee should have an official standing which will enable it to secure all available information.

Since the present law went into effect, ore deposits have come to be worked that were not then worked at all, owing to their low grade. Indeed a large part of the copper produced in the United States today is coming from ore deposits that could not be worked profitably so recently as ten years ago. These ore deposits are incapable of location according to the terms of the law of 1872. The mining industry wants a new law that will legalize the location of new ore deposits that may hereafter be discovered and that will give a security to mining titles.

It may be observed that some of the specific matters touched upon could be cured by amendments to the present law. My answer to this is that the law should be revised as a whole. There should be a harmonious relationship between all the provisions of the statute. This cannot be done unless the law is thoroughly revised and rewritten. Piecemeal attempts to right manifest injustices will not result in the permanent improvement of conditions which is the thought and desire of those urging creation of the commission.

I want to indorse Senator Walsh's statement in regard to the necessity of this, as viewed from the standpoint of a technical bureau. We think it will be in the interest of the efficiency of the operation of the Bureau of Mines that there be a revision and codification, and we urge that that be done as soon as it is possible to do so.

REVISION OF LAWS FIGHT IS NOT TO BE GIVEN UP

Plans for continuing the work looking to intelligent revision of the mining laws were discussed at a lunch given by F. F. Sharpless, of the Mining and Metallurgical Society of America, at the Lawyers Club, New York City, January 19. Those present were: J. Parke Channing, J. R. Finlay, E. B. Kirby, George C. Stone, James F. Callbreath, A. S. Dwight, W. R. Ingalls, F. F. Sharpless and Louis D. Huntoon.

Mr. Callbreath told those present of the hopeless legislative status of Senator Smoot's bill, providing for the revision of mining laws. Following Mr. Callbreath's remarks, an informal talk was held, during which plans were discussed for following up the matter in a way that would secure a satisfactory outcome.

CHANNING HAS EQUIPPED THREE LARGE COPPER MINES

J. Parke Channing, the well known mining engineer, at the request of the House Committee on Mines and Mining made the following statement with regard to his experience and connections:

"I am a consulting mining engineer, graduate of the Columbia School of Mines, and have followed my profession for thirty-two years. For the last fifteen years I have been in the financial, as well as the administrative, side of mining. I have developed and equipped three very large copper mines, and at the present time I am a large stockholder of and am vice-president of the Miami Copper Co. and also of the General Development Co., whose business is to investigate mining properties in their initial stage and carry them on to the producing stage. I am president of the Naumkeag Copper Co., of the Lake Superior district, which is conducting explorations."

At one point in his testimony Mr. Channing said:

"The present law discourages the prospector from going out and doing work. That is retarding the mining industry and eventually it is going to react against the interests of the whole country. The prospector goes out and he sees a nice piece of ground. To go back a little, the obvious and easily found mineral deposits in the United States were taken up years ago. The prospector now has to go out and hunt things that don't stick their heads up above the ground. There may be a little crack in the ground 2 or 3 inches wide, and he may have an idea that down below it is going to widen out. Now he goes and makes a location on it, and after he has started perhaps some other man comes along and says, 'Oh, there isn't any mineral discovery there. I am going to locate that.' So he may go 15 or 20 feet away and make another location and overlap the first man's claim. Then another man comes along and finds another likely looking crack 50 feet away, and he makes another location. Thus two or three or four locations may be made there, all overlapping, and the first man that comes there hasn't got the chance to develop that he ought to have. There are a great many men that used to do prospecting, but they have given it up and gone out of the business. The law ought to be such that when a prospector goes out and locates a piece of ground that is unoccupied he can put his claim on it and can hold it beyond the shadow of a doubt."

BIG ROAD RUNS TEST WITH CAR-HEATING HOSE

Desperate conditions developed not long ago through car-heating steam hose failures on one of the biggest roads in the country. Every official, from president down, was fighting delays due to bursting hose. The overhead run-up for several successive months was enormous. It was decided that hose tests alone would determine the cure for unusually heavy pressure trains and extremes in temperature.

With twenty-two trains running daily, the road installed 500 pieces of Goodrich car-heating steam hose, and reported no failures for January, the worst month in the year. February showed two failures, March none and April none. The test was made on condition that Goodrich, the manufacturer of the hose, be allowed to specify strength and quality in proportion to the heavier pressures, the greater number of cars and the additional amount of steam required to heat them.

The result proves conclusively that railroads can safely depend on large and reputable manufacturers for specifications of this kind. As a result of the test, Goodrich car-heating steam hose was adopted as standard, regardless of cost, and it has been found to save as high as 80 per cent of the usual replacements and tie-ups. There may be cases where it pays to buy for a first-cost consideration, but this particular test with car-heating steam hose proves conclusively that first cost is a minor factor, and that authorities on hose quality, like the B. F. Goodrich Company, at Akron, Ohio, can specify the really practical hose for long life and economy.

IMPORTANT TUNGSTEN AND ANTIMONY DEPOSITS FOUND

Advices to Delegate Wickersham tell of the discovery of an important tungsten deposit near Fairbanks. The vein is said to be four feet wide. The metal is of sufficient high grade that it is being sent out by mail.

Very high-grade antimony also has been found recently in the immediate vicinity of Fairbanks, Judge Wickersham states.

Addresses Vermont Society

Frederick J. Bailey, chief clerk of the Bureau of Mines, gave an illustrated lecture recently at a meeting of the Vermont Society of Washington at the Washington Club, on "Mine Rescue Work."

PRICES OF ANTIMONY REACH HIGHEST LEVEL IN HISTORY OF THIS MUCH-NEEDED METAL

Forty Cents a Pound Being Paid for American, Japanese and Chinese Product—Cookson's Unavailable at Fifty Cents—Wild Rose Spring Mines in California Largest Producers in United States

Antimony prices in 1915 were probably the highest known since the metal became a regular article of commerce. The high prices led to the largest production the United States has made and probably the same statement is true for the world's production.

According to preliminary figures collected for the United States Geological Survey by Frank L. Hess the production of antimony ores in the United States is estimated to have been about 5,000 tons containing 2,000 tons of antimony, valued at about $325,000. The largest previous domestic production was in 1892 when 150 tons of metal were produced in San Francisco from Nevada ores and 380 tons of ore carrying 55 per cent of antimony were exported. Practically all operations of the past year were new, most were small, and they were widely scattered so that it is difficult to obtain close figures immediately after the close of the year.

Antimony which in July, 1914, had been down to a monthly average price of 7.11 cents for Cookson's, and from 5.44 upwards for other brands, rose gradually, though unsteadily, to the end of 1915 when Chinese, Japanese and American antimony were quoted at about 40 cents a pound.

Quotations for Cookson's antimony ceased in May, 1915, some time after an embargo had been declared against the shipment of antimony metal or ores from the British possessions, and 50 cents a pound is said to have been paid for it about June 1, when Chinese was selling for about 35 cents or less. In the fall American antimony appeared on the market for the first time in many years. At first it sold slightly below Chinese and Japanese, but was soon quoted at the same price. Miners and smelters, apparently thinking that the high prices would be temporary, did not begin production as quickly as they otherwise might have done, but before the close of the year properties in Alaska, California, Idaho, Nevada, Oregon, Utah and Washington were producing.

Prices for ores ranged from $1.00 to $2.10 per unit of antimony. At first, only ores carrying 50 per cent or more antimony were in demand, but before the close of the year 20 per cent ores were being shipped from Nevada.

From Alaska, according to data collected by Alfred H. Brooks, about 685 tons of stibnite ore carrying 58 per cent antimony was produced in the Fairbanks district from properties on Eva, Vault, Treasure and Chatham creeks. It is reported that 132 tons were shipped from Nome, but it seems probable that more was mined.

The largest production was made from deposits near Wild Rose Spring, on the northwest slope of Telescope Peak in the Panamint Range, California. These deposits have been known for many years but have been too far from railroads for profitable exploitation until the past year when prices were high and a branch railroad was built to Trona on Borax Lake, within about 25 miles of them. The deposits contained considerable antimony ocher as well as stibnite and were mined by the Merchants Finance Co. (Western Metals Co.) The same company operated deposits 30 miles northeast of Mojave, which are 10 miles from the S. P. R. R. at Neuralia, in Kern County. Other deposits were mined in California at many points in Kern County, in the eastern end of San Benito County, and on Moore's Flat near Grass Valley. In Nevada considerable quantities were mined at many points mostly in the northwest quarter of the State with Lovelock as a center, but ranging from Pass Canyon in the Pine Forest Range southward to the vicinity of Tonopah and eastward to Joy.

Oregon, Washington and Idaho produced small tonnages of ore and in Arkansas a company was organized to work old properties west of Gillham.

The Chapman Smelting Co. of San Francisco which had been idle for a number of years again started the smelting of antimony ores. The company mined ore at Bernice, 60 miles east of Fallon, Nevada, and brought ores from other points in the Western States, Alaska and British Columbia.

The Merchants Finance Co. built an antimony smelter at Industrial Harbor, Los Angeles. Besides operating California mines the company operated mines in Nevada and bought ores from the Western States, Alaska, and foreign countries.

The Antimony Smelting and Refining Company of Seattle started a plant at Van Asselt the last of the year and made oxide, but metal is to be smelted also.

The International Smelting Co. bought ores to be smelted at its South Chicago plant. The Great Western Smelting and Refining Co., of Chicago, and the Pennsylvania Smelting Co., of Pittsburgh, have also smelted some ores. The Magnolia Metals Co. found so much difficulty in obtaining needed supplies of antimony at a reasonable price that it bought and mined ores in Nevada, smelting them at Brooklyn.

Harshaw, Fuller and Goodwin Co. of Cleveland, were in the market for pure ores, from which to make antimony salts, heretofore made from Chinese "crude antimony."

The tendency has been for some companies to go to an expense for mine development, machinery and mills not wholly warranted by the circumstances. The present high prices are necessarily temporary. The Chinese deposits are extensive, and worked by very cheap labor, and other deposits are being developed in other parts of the world, and as soon as the war is over, and possibly before, prices will probably drop to a level with or close to those of 1914.

TELLS OF HUGE REPTILES WHICH ONCE INFESTED NORTH AMERICA

Geological Survey Report Delves Interestingly Into Features of Past Ages on This Continent

The United States Geological Survey has just published a report which, though technical, nevertheless embodies some interesting history of the early ages of the North American continent. It tells of the rise and fall of a portion of the continent millions of years ago, long before the age of man, at a time when strange beasts inhabited the country, when the climate was subtropical, and when a peculiar swamp vegetation flourished, the remains of which were converted into the present great coal beds of the West.

Late in what is termed by geologists "Carboniferous time," according to W. T. Lee, the author of the report (Professional Paper 95-C), there were mountains in Colorado and New Mexico comparable to the present Rocky Mountains. During the Triassic period and much of the Jurassic, which followed, a time to be measured in millions of years, these mountains were eroded away. Late in the Jurassic period a wide area had been worn down so near sea level that a slight subsidence of the land allowed sea water to enter from the Pacific Ocean and spread over Wyoming, northern Colorado and eastern Utah. Near the close of the Jurassic a slight uplift expelled this sea. After some time this area began again to settle and the streams spread fine sediments over the bed of the shallow basin lately occupied by the sea and over the low-lying lands. This subsidence introduced the Cretaceous period and culminated in the occupation of the region by a sea which reached from Utah to the Mississippi Valley and from the Gulf of Mexico to the Arctic Ocean.

The subsidence was slow at first and the streams spread their muds uniformly over an area extending from New Mexico to Montana and from Utah to Kansas. Only small areas of the Rocky Mountain region were not covered by them. In the streams, swamps and bayous of this early Cretaceous time lived huge reptiles; some of them were 85 feet long and 20 feet tall, with a bulk many times as great as the largest elephant of today. By the close of the Lower Cretaceous time the water from the Gulf of Mexico had spread over the graded plain as far as the present Rocky Mountains. This invasion of the sea was followed, apparently without great lapse of time, by a still greater invasion in the Upper Cretaceous epoch.

The first deposits of Upper Cretaceous age —the Dakota sandstone—were spread out uniformly over the level plain, which then included the whole area that was later pushed up to form the Rocky Mountains. Over these sands which were laid down along the advancing front of the sea, were deposited the marine sediments as the sea moved forward. In its waters lived great numbers of serpent-like swimming reptiles; and over it soared pterodactyls, the fossil remains of which show that they measured 18 feet from tip to tip of wings. On the shores and in its waters sported large diving birds, which still retained the teeth inherited from their reptillian ancestors.

On the shores of this sea, especially along its western margin, great swamps developed and in them grew a variety of semitropical plants, such as palm and fig trees. The resulting carbonaceous material which acculated as peat was later converted into coal. The sea did not attain its maximum size at once. Probably at no one time was the whole interior basin under water. The advance of the sea and the filling of the basin kept pace with each other, so that sediments and fossils which indicate nearness to shore and coal beds which indicate swamps above sea level are found at many positions from bottom to top of the Upper Cretaceous formations.

At the close of the Cretaceous period notable changes were produced in the geography of the region. The interior basin, which had been subsiding throughout the Cretaceous period, was now lifted; its waters were poured back into the oceans, and the mountains whose roots had been buried were resusticated. In some places the erosion that followed removed from these newly lifted mountains the Cretaceous rocks that once covered them and cut deep enough into the underlying formations to obtain the pebbles of older rocks, which may now be found in the lower part of the oldest Tertiary beds. In other places the Cretaceous rocks were not entirely removed. Beds that once lay 5,000 feet below the level of the sea were lifted to form mountain tops that now stand more than 13,000 feet above sea level.

Working on Anthracite Map

N. H. Darton, of the U. S. Geological Survey, is working on a map showing the configuration of the northern anthracite coalfield of Pennsylvania.

VALUE OF SPELTER MINED IN U. S. DURING 1915 INCREASES 300 PER CENT

Year Just Passed, Greatest in History of Zinc Mining and Smelting in This Country — Prospects for 1916 are Even Better—Smelter Capacity Increased Decidedly During Last Half of Year

Both the zinc smelting and the zinc mining industries of the United States enjoyed a year of unparalleled prosperity in 1915. According to the best information obtainable at this time the recoverable zinc content of zinc ores mined in the United States in 1915 was over 560,000 short tons compared with 407,000 tons in 1914 and 418,000 tons in 1913. With a continuance of high prices for spelter during 1916 the output will be greatly augmented, for the very high prices did not begin until April and May and it was naturally some time before much additional zinc mining could get under way. The production during the last quarter of the year was at a much higher rate than during the first quarter.

For the same reason the output of spelter during 1916 should be much greater than it was in 1915, provided the spelter market remains the same. The output during the first half of 1915 was at the rate of 433,000 tons a year; during the last half it was at the rate of about 550,000 tons. Though the total spelter produced in the United States in 1915 increased 40 per cent over the preceding year, the value of the output increased nearly 300 per cent. However, even this does not represent the true value for it is based on the average price of prime western spelter, whereas there was a large production of brass special, intermediate, and high-grade spelter, all of which command premiums. The real value of the spelter output was therefore probably between 10 and 25 per cent more than the value as given.

LARGER SMELTING CAPACITY.

There was a large increase in smelting capacity during the last half of the year, the total number of retorts at the end of the year being 154,898, as compared with 130,642 at the mid-year, and with 113,914 at the beginning. In addition 20,758 retorts were under construction or planned. New plants, the construction of which started since the Geological Survey's mid-year report, are those of the American Steel & Wire Co., at Donora, Pa.; the Kusa Spelter Co., the La Harpe Spelter Co., and the Oklahoma Spelter Co., all at Kusa, Okla.; the Henryetta Spelter Co., at Henryetta, Okla.; the American Spelter Co., at Pittsburg, Kans.; and the Owen Zinc Co., at Caney, Kans. In addition to these a four-block smelter with 2,560 retorts is planned in Oklahoma, the exact site not yet having been selected. This does not include the 10-ton electrolytic zinc plant at Anaconda, Mont., or the 100-ton electrolytic plant under construction at Great Falls, Mont., and others contemplated, or the electrothermic zinc smelter planned at Keokuk, Iowa.

It seems certain that the zinc-reduction capacity of the United States will soon be equal to every conceivable call upon it. The all-absorbing question is as to what demands will be made upon it in 1916. Brass cartridge cases, large or small, may be used as many as 35 or 40 times. Doubtless it will be possible to save and reload many of the empty cases used in the war and in time this should tend to lessen the demand for spelter. On the other hand, the recent lengthening of the battle lines in Europe should increase the demand for the metal. Furthermore, the growing demands for home consumption must become a greater factor in 1916. These demands will have to do not only with current operations but with restoring reserves and stocks that have been allowed to become depleted during several lean years. For this reason an average prosperous year should show a home consumption of zinc above the average.

The following figures have been compiled without change by C. E. Siebenthal of the Geological Survey, from reports furnished by all operating smelters of zinc ores except one, showing their output for the first 11 months of the year and their estimated production for December. The output of one smelter, treating both ore and drosses, has been estimated. Figures showing the imports and exports for 10 months were obtained from the Bureau of Foreign and Domestic Commerce and to these figures estimates for November and December have been added.

A RECORD PRODUCTION.

The production of primary spelter from domestic ore in 1915 is estimated at 460,000 short tons, and from foreign ore at 30,000 tons, a total of 490,000 tons, worth, at the average St. Louis price, $139,160,000, compared to a total of 353,049 tons in 1914, worth $36,010,998, and made up 343,418 tons of domestic origin and 9,631 tons of foreign origin. This was a gain of 137,000 tons and of more than $103,000,000 in value. As noted above, however, the gain in value was considerably more than this amount. The production of spelter from both domestic and foreign ores, apportioned according to the

States in which it was smelted, by six-months periods, was as follows:

Spelter production, 1914–15, *by States, in short tons.*

	1914		1915	
State.	*First half.*	*Second half.*	*First half.*	*Second half.*
Illinois	62,062	65,884	74,982	85,348
Kansas........	23,737	20,773	35,247	65,398
Oklahoma. ...	45,443	45,924	51,172	57,532
Other States ...	43,816	45,410	55,131	65,190
Total......	175,058	177,991	216,532	273,468
Yearly total....	353,049		490,000	

While the output of each State was more in the second half of the year than in the first Kansas showed the greatest gain, nearly doubling the production of the first half and getting back to old-time figures.

The number of retorts at the beginning of 1915 was 113,914, at the midyear it was 130,642 and at the end, 154,897. All available retorts were in active operation and new retorts were put into commission as fast as completed. The large amount of the higher grades of spelter made by redistillation from the ordinary grades necessitated a greatly enlarged retort capacity, so that the actual output of spelter in itself gives no reliable clue to the number of retorts in use. It is not feasible at this time to give the production of redistilled spelter.

The capacity of the zinc smelters by States, together with the additions now planned for 1915, exclusive of the proposed plant on an unselected site in Oklahoma with site undecided, is as follows:

Zinc smelting capacity, 1915.

State.	*Total retorts end of* 1915.	*Retorts to be added in* 1916.
Illinois.	38,424	4,840
Kansas..	40,366	......
Oklahoma	39,212	7,710
Other States	36,896	8,208
Total	154,898	20,758

LARGEST INCREASES IN EXPORTS.

Exports of spelter and sheets made from domestic ore are estimated at 115,000 short tons worth $25,530,000, compared with 64,807 tons in 1914. Exports of spelter made from foreign ore are estimated at 13,000 tons, valued at $2,250,000, compared with 5,580 tons in 1914. The exports of brass are estimated at 33,500 tons, valued at $12,200,000, compared with 3,558 tons in 1914. Manufactures of brass were exported to the value of about $30,000,000, as compared with $3,756,888 in 1914. During the first nine months of the year there were also exported under drawback articles manufactured from 255 tons of foreign zinc, on which duty had been paid, compared with 4,981 tons in 1914.

The exports of domestic zinc ore were about 900 short tons, valued at $45,000, compared with 11,110 tons in 1914. Foreign zinc ore containing 609 tons of zinc and valued at $24,270 was reexported. The imports of spelter (probably mostly scrap) are estimated at 863 short tons, valued at about $122,358, compared with 880 tons in 1914.

The imports of zinc ore in 1915 were approximately 135,000 short tons, containing about 48,000 tons of zinc, and worth about $4,000,000, compared with 31,962 tons of ore, containing 12,132 tons of zinc, in 1914. The zinc imports for the first 10 months of 1915 were as follows:

Imports of zinc ore, January–October, 1915, *in short tons.*

Country.	*Ore.*	*Zinc content.*	*Value.*
Australia..........	45,972	16,700	$1,273,431
Canada...........	8,907	3,494	148,636
China and Japan...	7,572	3,213	193,604
Italy.............	5,312	2,125	153,388
Mexico......... .	49,694	14,521	1,610,270

DOMESTIC CONSUMPTION INCREASED.

The apparent domestic consumption of spelter in 1915 may be computed as follows: The sum of the stock on hand at smelters at the beginning of the year, 20,095 tons, plus the imports, 863 tons, and the production, 490,000 tons, gives the total available supply—511,000 tons. From this are to be subtracted the exports of domestic spelter, 115,000 tons, the exports of foreign spelter, 13,000 tons, the exports under drawback, 255 tons, and the stock on hand at smelters at the end of the year (to be exact, on December 15), 20,758 tons, or a total of 149,000 tons, leaving a balance of 362,000 tons as the apparent domestic consumption. This calculation takes no account of the stocks of spelter held by dealers or consumers. On comparing the consumption in 1915 with the 299,130 tons consumed in 1914, the 295,370 tons in 1913, and the 340,341 tons in 1912, it appears that the indicated consumption is not large when the larger exports of brass and manufactures of brass are considered. The stocks are between three and four times as great as at the midyear, but these are probably to be explained as accumulations of the common grade of smelter, the demand being for the higher grades. Reviving domestic consumption will apparently take care in the future of such surplus output of prime western spelter.

HIGHER PRICES.

Spelter opened at St. Louis in January at 5.5 cents a pound and immediately began the long rise, which except for one considerable setback in March and a smaller one in May continued until June 4, when spelter reached 26.5 cents a pound. A sharp drop immediately carried the price down to 17.75 cents by June 22, after which it recovered to 22.75 cents by July 9. Another sharp break let the price go down to 10.75 cents in the middle of August. Several ups and downs followed, after which the price rose to 19 cents in the latter part of November. A sharp decline carried the price down to 15 cents at the middle of December. A rapid recovery followed, and spelter closed the year at about 17.25 cents a pound. The average price for the year of prime western spelter at St. Louis was 14.2 cents a pound.

The London spelter market opened at £28 2s. 6d. a long ton (6.1 cents a pound) and, nearly paralleling the American market, rose to £110 a long ton (23.8 cents a pound) in the middle of June, dropped to £55 a long ton (11.9 cents a pound) in August, rose to £105 a long ton (22.7 cents a pound) in November, and closed the year at £90 a long ton (19.5 cents a pound). In the first nine months of the year the London price was sometimes below and sometimes above the American price, but from October onward the London price was consistently the higher, in November and December averaging nearly 2 cents a pound more than the St. Louis price.

The price of the "brass special" grade of spelter at Waterbury, Conn., usually averages about 0.4 cent above the St. Louis price. During 1915, however, the differential ranged from 2.5 to nearly 5 cents, averaging about 3.3 cents. The price of the highest grades of spelter is not quoted, but sales are reported at more than 40 cents a pound when spelter was at the high point.

The price of sheet zinc generally ranges from 2 to 2.5 cents above the St. Louis price of spelter. During 1915 sheet zinc has varied from 2.5 to 8.75 cents above the price of spelter.

Zinc dust, heretofore mostly imported from Europe, generally ranges from 1 to 2 cents a pound higher than spelter. In March, 1915, the price of zinc dust began to go up, and in the first two weeks of June it more than doubled, jumping from 17 cents to 40 cents. There was a decline of a few cents, but by the last week in July the price had settled back to 38 to 40 cents per pound, at which it has since remained.

FAILURE OF INDUSTRIAL RELATIONS BODY LAMENTED

Great Opportunity Offered for Good—Walsh so Violently Biased as to Spoil Results

The United States Commission on Industrial Relations cost some $500,000. Its members, representing, or appointed to represent the general public, the employed and employers, made three main reports and three supplemental suggestions embodying opinions or theories, and containing, the mathematicians estimate, 200,000 words, says the New York Tribune editorially. The public must sympathize with the purpose, or what should be the purpose, of such a board, the dispassionate collection of facts in regard to the conditions of industrial employment, the relations between workingmen, organized and unorganized, and employers, the merits and the defects of labor organizations and employers' associations, strikes, boycotts, hours, wages, output, prices as affected by labor unions, a great nexus of economic interdependencies. There is a general public as well as a particular private, interest in these matters. The prosperity and even the social peace of the State is largely bound up in the status of these and similar questions. Moreover, the temper of the age is humanitarian. Indeed, no inconsiderable part of the community, in its generous desire to help what it conceives to be the weaker side, is sometimes inclined to forget that tyranny, duplicity and injustice are human, not a monopoly of employers.

What the commission should have yielded was a calm view and review of the actualities of the labor situation, with reference to the correction of inequalities and injustices, not necessarily wholly by legislation, but by public opinion, making its own judgment on accepted facts. Unfortunately, the chairman of the commission, one of the three members appointed to represent the public, has displayed from the first a heat and violence of bias and a passion of intemperant speech that have disgusted some of his colleagues, destroyed confidence and deadened interest in the commission, made it mainly a fantastic futility.

Two reports discredit the work of Mr. Walsh's "investigators." The report signed by him and the three representatives of labor purposes, according to the published summary, a new inheritance tax so graded that while making generous provision for the support of dependents and the education of minor children, it shall leave no large accumulation of wealth to pass into hands which had no share in its production. The money snatched from the unproductive rich is to be used to extend education, to develop "other important social services" yet to be disclosed, and in association with States and municipalities on "great constructive work, such as road building, irrigation, and reforestation."

It is superfluous to characterize this frank project of confiscation. Will the English language be enriched with a verb "to walsh"? What is the use of considering seriously a report which demands a Constitutional amendment already incorporated as the Bill of Rights in the Constitution, and proposes

That Congress immediately enact by statute or, if deemed necessary, initiate a Constitutional amendment specifically prohibiting the courts from declaring legislative acts unconstitutional.

"Swollen, unearned fortunes," "an innumerable number of parasites of every type," "the growth of a hereditary aristocracy"—it is the old jargon. Apparently, Mr. Walsh's "Director of Research and Investigation" supposed that the commission was appointed to redistribute wealth in excess of a million dollars.

The report signed by Professor Commons and Mrs. Harriman, and, with certain exceptions, by the commissioners representing employers, contains, we regret to notice, another extraordinary project. A permanent Commission on Industrial Relations—*the one just* dead having been so singularly successful—is to be established. It is to consist of three persons, appointed by the President and confirmed by the Senate. It is to be aided by an unpaid advisory council, comprising ten representatives of associations of farmers and employers, ten of labor associations, and the Secretary of Commerce and the Secretary of Labor. It may conduct investigations, more felicitously, let us hope, than its namesake, but its main business is to administer the labor laws. Another addition to bureaucracy.

To support the Industrial Commission and "further social welfare, without increasing taxation of the people," the Federal Fund for Social Welfare is to be raised by means of an inheritance tax rising from 1 per cent. on estates of more than $25,000 left to direct heirs to 15 per cent on estates of more than $1,000,000.

By increasing the rate as proposed it is estimated that a fund of $200,000,000 a year would be collected, of which $50,000,000 would be returned to the various States.

The principal of this fund it is proposed to invest in homes for workingmen, hospitals, rural credits for farmers, and such other purposes of a social nature as would insure an income.

The income from the fund, which would be administered by the Industrial Commission, would be used to meet the expenses of the commission; to promote the social well-being in the shape of establishing sickness and unemployment insurance, old age pensions, the establishment of employment offices, the promotion of industrial education through subsidies paid to the various States, and enabling tenant farmers to acquire possession of their farms.

Here again let the scheme speak for itself. We only permit ourselves to wonder how its proposers imagine that this enormous sum is to be produced by a taxation from whose incidence "the people" are absolutely secure. This report recommends, on the distinctly humorous ground that immigration is an important question between labor and capital, the administration of the immigration laws by the Industrial Commission. The commission would be in the hands of "labor," which is distinctly hostile to immigration. In case of a scarcity of labor, what chance would the employer have?

The three employer commissioners dissent from the approval given by Dr. Commons and Mrs. Harriman to the secondary boycott. "A rank injustice," they call it. Such it seems to many or most of us. These three commissioners give the impression of fairness and moderation. What they have to say about sympathetic strikes, union politics, union failure to keep agreements, restriction of output, the closed shop, union violence, apprenticeship rules, is well worth reading by everybody; and with much of it many unionists, individually at least, can agree. It is to be regretted that the labor representatives are not always as measured. One of them, indeed, Mr. A. B. Garretson, seems to be suffering from tumidity of the vocabulary. The question may suggest itself to the reader of the first two reports if there is anything like the amount of "unrest" and disbelief in the equality of justice which they assume.

EDITOR'S NOTE.—The above comment on the Industrial Relations Commission by the New York *Tribune,* made several months ago, is of particular interest, in the light of the continued activities of the unofficial committee, under the direction of Mr. Walsh, which has permanent offices in Washington.

UNITED STATES WILL BE READY AT CLOSE OF WAR

National City Bank's Publication Says Manufacturers and Labor Leaders Are Working Together—Danger of War Orders.

The effect of changed trade conditions due to war orders on the general industrial life of the country, and the possible consequences of the resultant displacement upon America's capacity for international trade competition after the war, is discussed in *The Americas,* published by the National City Bank. While the changes resulting from the war business have been serious, the article asserts that widespread inquiry shows that the leaders of industry are alive to the danger that will follow when war orders cease.

"There is so much evidence of more than casual interchange of opinion and community of policy and action in the attempt to solve the problem," continues the article, "that it can almost be said that there is a concerted movement in formation to get the situation in hand. This warrants confidence that when the time comes that we must meet close competition again in the world's markets, including our home markets, the national industries will be in strong formation."

Among the difficulties specified as a result of war orders, the first is the rise in the cost of raw materials. Metals have increased from 20 to 40 per cent, wool is much higher, cotton is rising, and food, though not as high as at first, is still far enough up to give ground for the popular conception that the cost of living is still high. "These increases in the cost of materials," it is said, "have caused an appreciable rise in the cost of manufacture in lines not directly catering to war demand. The higher costs have appreciable effect on our manufacturers' campaign for the expansion of export business."

RISE IN THE COST OF LABOR

"What is generally taken as a much more serious matter is the rise in the cost of labor.

Preliminary examination of reports from the Eastern States indicates that munition plants are paying their labor about 35 per cent more, in wages and bonus, than the normal wages heretofore prevailing. Over the broad range of general industry not catering to war requirements, there has been only a little rise in wages here and there; but to keep shop organizations intact, some manufacturers have found it necessary to hold their men by meeting, to a certain extent, the higher offers of money made to workmen by the munitions makers.

"The emergency work for the best skilled workmen has been more than men could be found for. An official report of one of the manufacturers' associations states that some munitions makers who have tried to run their machinery day and night with three eight-hour shifts of men have had no success with the plan because the night shifts could not be filled up to a workable quota.

"The demand for labor at high prices in war manufactures has also raised the labor costs of many other factories. Even such men and women as could not work on munitions have become restive in their own places because of the prosperity of acquaintances who are busy on war orders. With the seasonal increase in mercantile and industrial activity there may be a more general tendency to increases in labor costs, and one of the country's shrewdest manufacturing executives says that if wages go up it will be next to impossible to get them down again at the end of the war.

"Another serious phase of the situation arises out of the disorganization of industrial forces through the shifting of large numbers of men out of factories where years of team work have made them efficient parts of the factory organization, to which many will never return. Moreover, too many concerns have been so absorbed in war orders that they neglect old customers and thus lose business that they will need before long.

WORKING HAND IN HAND

"Now, this situation is being faced in a remarkably constructive spirit by many strong men acting in unanimity. Several manufacturers' associations are maintaining a general discussion of the best policies to pursue. There is no friction between the manufacturers, and as regards the wage problem a very wise attitude has generally been assumed by employers, so that national labor leaders are able to join with them in the most important matters of policy.

"The policy is to concede to labor an increase over ordinary wages in case of the manufacture of war materials, but to put this increase in the form of bonus and special payment and in every way to get on a basis of friendly understanding between employer and employe that the extraordinary profits of war orders are to be shared, without any alteration of the basic standard of wages. Nearly everywhere the pay of the workmen is given to them in two forms, the regular weekly envelope on the established wage basis, and bonus payments, deferred and made to the workmen at longer intervals, frequently in the form of checks and in varying amounts. A systematic attempt is made to get the workmen to set aside the special payments as savings.

"National labor leaders have shown a serious appreciation of the community of interest between employers and employes in this situation. They appear to be ready to cooperate in furthering a friendly understanding about wages and in preparing for the readjustment that must come later.

"The United States manufacturer is not going to be permitted to forget that national industry cannot get away from economical standards of production without running serious chances."

WHEN EUROPE COMES BACK

A high authority is quoted as saying: "Industry in this country is going to be ready for sharp competition at the end of the war. It seemed certain when the war began that it would end with Europe badly crippled and unable to offer competition for years. Europe has surprised us already. It now looks as if the nations might come back very quickly and with great strength. But I am confident that United States industry will be ready for the competition. The situation is being handled with rare intelligence, and manufacturers are awaking to the needs of the hour. The connections we are now making in foreign markets will be of great help because some of them are sure to persist."

"The profits of our war orders," the article concludes, "are being widely distributed and, if rightly used, can help strengthen national industry for the world-wide commercial struggle that is coming. Not however, if the benefits be perverted into rampant general extravagance or speculation, and we forget the grave danger of a lapse from standards of economy and efficiency. If manufacturing costs and prices rise we will offend the temporary foreign buyers of whom we might make permanent customers and will find ourselves in a costly state of unpreparedness when Europe comes back."

Mining Congress members are requested to advise the Washington office of any change of address. Copies of the MINING CONGRESS JOURNAL are being returned for want of a proper address. This applies to some of the first-class mail addressed to members.

UNITED STATES MINES MORE THAN 600,000 TONS OF LEAD DURING 1915

Gain of Fifteen Per Cent Made Over the Output of the Year Preceding—Year saw Opening of Construction Work on Smelter at Coeur d'Alene—Mexico Continues to Import Some Lead.

The lead industry in 1915 made good gains in output, both in mining and smelting. The lead content of ore mined in the United States was apparently over 600,000 short tons, compared with 522,864 tons in 1914, an increase of 78,000 tons, or 15 per cent. With the higher prices prevailing the percentage of increase in value of the 1915 output was even greater as compared with other years.

During 1915 construction was begun on one lead smelter and plans were completed for another, both to treat ore from the Coeur d'Alene district of Idaho. The Hercules Mining Co. purchased the copper smelter at Northport, Wash., and began the construction of two lead furnaces. This company is affiliated with the Pennsylvania Smelting Co. of Pittsburgh, Pa. The Bunker Hill & Sullivan Co. of the Coeur d'Alene district also completed plans for a smelter, but the site is yet in abeyance. The National refinery of the American Smelting & Refining Co., at Chicago, was dismantled, and the Balbach Smelting & Refining Co. abandoned its older lead plant at Newark, N. J.

The following estimates have been compiled by C. E. Siebenthal from reports to the United States Geological Survey by all the lead refineries and soft-lead smelters in operation during the year, except two smelters in the Joplin district, for which estimates have been made. These reports cover actual production for the first ten or eleven months of the year, with an estimate for the remainder of the year, and from them the figures of production are made up without change. The statistics of imports, exports, and lead remaining in warehouse have been taken from the records of the Bureau of Foreign and Domestic Commerce for ten months, the figures for November and December having been estimated.

LARGEST PRODUCTION TO DATE

The production of refined lead, desilverized and soft, from domestic and foreign ores in 1915 was approximately 565,000 short tons, worth at the average New York price $53,110,000, compared with 542,122 tons, worth $42,285,500, in 1914, and with 462,460 tons in 1913. The figures for 1915 do not include an estimated output of 20,550 tons of antimonial lead, worth $1,886,000, against 16,667 tons in 1914 and 16,665 tons in 1913. Of the total production, desilverized lead of domestic origin, exclusive of desilverized soft lead, is estimated at 306,682 tons, against 311,069 tons in 1914 and 250,578 tons in 1913; and desilverized lead of foreign origin at 48,318 tons, compared with 29,328 tons in 1914 and 50,582 tons in 1913. The production of soft lead, mainly from Mississippi Valley ores, is estimated at 210,000 tons, compared with 201,725 tons in 1914 and 161,300 tons in 1913. The total production of lead, desilverized and soft, from domestic ores, was thus about 516,682 tons, compared with 512,794 tons in 1914.

The final figures for the production of soft lead will show an increase of a few thousand tons over those here given, for the reason that the smelters and refiners of argentiferous lead undoubtedly treated more or less soft lead from the Mississippi Valley which is not distinguished from silver-lead ores in their preliminary estimates.

IMPORTS AND EXPORTS

The imports of lead are estimated at 9,625 short tons of lead in ore, valued at $653,000; 50,825 tons of lead in base bullion, valued at $3,496,000; and 400 tons of refined and old lead, valued at $28,000—a total of 60,850 tons, valued at $4,177,000, compared with 28,338 tons in 1914. Of the imports in 1915 about 58,000 tons came from Mexico, against 23,141 tons in 1914. These imports from Mexico are to be compared with an average of over 100,000 tons before the civil strife in that country. The remaining imports of lead came mostly from Chile.

The exports of lead of foreign origin smelted or refined in the United States again show an increase, being estimated at 43,000 tons, against 31,051 tons in 1914 and 54,301 tons in 1913. For the last two years, on the other hand, notable quantities of domestic lead have been exported to Europe, and the total for 1915 is estimated at 76,000 short tons, valued at $6,650,000, compared to 58,722 tons, valued at $4,501,674, in 1914.

LEAD AVAILABLE FOR CONSUMPTION

The amount of lead available for consumption during 1915 may be estimated by adding to the stock of foreign lead (domestic stocks are not known) in bonded warehouses at the beginning of the year (7,668 short tons) the imports (about 60,850 tons), the additions by liquidation (1,795 tons), and the domestic production (516,682 tons), making an apparent supply of 587,000 tons. From this are to be subtracted the exports of foreign lead (about 43,000 tons), the exports of domestic lead (76,000 tons), and the stock in bonded warehouses at the close of the year (assumed to be the same as at the close of

October, 16,000 tons), leaving as available for consumption 452,000 tons compared with 449,052 tons in 1914.

HIGH PRICES

Lead began the year at New York with a price of 3.8 cents a pound, nearly the minimum price of the year, and remained practically stationary until the middle of February. A gradual rise brought the price to 4.2 cents in April, and it remained there until the latter part of May. A rapid rise next followed, and lead reached the maximum for the year at 7.56 cents on June 14. A sharp decline, followed by partial recovery and then by a more general decline, brought the price to 4.4 cents in the latter part of August. After a slight recovery and another decline to 4.45 cents in September, the price gradually rose and closed the year at about 5.4 cents. The average New York price for the year was 4.7 cents a pound, compared with 3.9 cents in 1914 and 4.4 cents in 1913.

The London price of lead started at £19 a long ton (4.1 cents a pound) and rose until the latter part of March, when it reached £23 2s. 6d. a long ton (5 cents a pound). From this point the price fell to £20 1s. 3d. a long ton (4.3 cents a pound), after which there was a sharp ascent to £28 2s. 6d. (6.1 cents a pound) at the middle of June. After several ups and downs the price dropped to £20 6s. 3d. (4.4 cents a pound) by the middle of August, and then a gradual rise carried it to £29 5s. a long ton (6.3 cents a pound), and it closed the year at about that figure. The London market was fairly parallel to the New York market and, except for the period of high prices in the United States during July and August, was uniformly higher than the American market.

MILLING OPERATIONS IN JUNEAU EMPLOY 1,000 STAMPS

Development in the Juneau gold belt during 1914 is the subject of a report just issued by the United States Geological Survey. Henry M. Eakin, the author, says:

"The developments near Juneau, because of their magnitude, overshadow the operations in other parts of the gold belt, yet some of these, too, are of importance. The active small-scale mining and milling operations that were conducted a few years ago in the Eagle River and Berners Bay districts have recently experienced a decided falling off, due in part to a failure of some of the properties to meet expectations and in part to consolidations preliminary to operations on a larger scale.

"Gold lode mining in this field, already developed on a scale that ranks the Juneau district with the foremost in the industry, is rapidly assuming still greater proportions. The growth is a natural response to a fuller knowledge of the size and character of the ore bodies and the economic possibilities of large-scale operations.

"Climatic conditions are favorable to continuous operation. The large size of some of the ore bodies, the physical character of the ores, and a strong topographic relief favor the production of large quantities of ore with a minimum of labor and power. Water power, marine transportation, and a local supply of timber and lumber reduce general expenses to a low point. The extraordinary low costs of operation make available low-grade ores that under conditions only slightly different would be valueless.

"The chief productive mining activity in the Juneau district in 1914 was at the four mines of the Treadwell group, on Douglas Island, where lode mining has been done since 1882 and large-scale operations have been in progress since 1887. The most important development work in progress in 1914 was that of the Alaska-Gastineau, Alaska-Juneau, and Alaska-Ebner mining companies, operating the mines of Silver Bow Basin and Gold Creek, on the mainland a few miles east of Juneau. Prospecting work on a smaller scale was being done at the Salmon Creek mine, near the mouth of Salmon Creek, and at the Alaska Treasure mine, on Douglas Island, about 4 miles southwest of the Treadwell.

"The milling operations in the vicinity of Juneau in 1914 were equivalent to the constant operation of about 1,000 stamps. Mining and milling operations combined gave employment to an aggregate of about 2,250 men.

"The Treadwell group of mines consists of the Treadwell, Seven Hundred Foot, Mexican, and Ready Bullion mines, on the east side of Douglas Island near the shore of Gastineau Channel, along the strike of a single lead. In the first three mines the lode has been developed continuously for about 3,500 feet. Between the Mexican and Ready Bullion mines is an undeveloped interval of about 2,500 feet.

"The ore deposits consist of mineralized dikes of albite diorite intrusive in black slates and belonging to a series of intrusive bodies that appear at intervals along a zone approximately 3,000 feet wide and 3 miles long. The mineralized dikes are cut by reticulating veinlets of quartz and calcite. Both dikes and veinlets may carry metallic sulphides and gold.

"During 1914 all the stamps of the Treadwell group were in practically continuous operation. During this period 1,602,150 tons of ore was crushed, yielding a total output of gold valued at $3,743,944.

"Of the total yield, $2,004,527 was recovered as free gold, and $1,739,417 was recovered from the sulphide concentrates. The average yield per ton of ore milled was $2.34 and the average operating costs were $1.20, giving a net revenue of $1.14 a ton.

"A total of 22,814 feet of development work was done in the four mines, 10,036 feet in ore and 12,778 feet in waste. This work was directed chiefly toward the development of the ore bodies on the lower levels, especially the 2,100-foot level in the Treadwell, the 1,460-foot level in the Mexican, and the 1,370 to 1,900 foot levels in the Ready Bullion and Seven Hundred Foot mines."

COMPLEX NATURE OF SMELTER RATES NOT OFTEN DUE TO ULTERIOR MOTIVES

New Processes, Varying Types of Ores and Increasing Detail Responsible for Complicated Schedules—Penalty for Silica Sometimes Is Too High

A long-felt want has been filled, it is believed, by the publication of Technical Paper No. 83 by the Bureau of Mines. It deals with the buying and selling of ores and metallurgical products. Extracts from this paper follow:

It is evident from the foregoing that smelting rates and schedules are of a complex nature, although the principles on which they are based are reasonably simple. It is frequently stated that these rates and charges are made willfully complex by the buyer, in order to obscure the amount of the deductions made. This view may perhaps have been correct in some instances, but the main reason for the complexity of present rates and schedules, is to be found in the fact that the details have been increased from time to time as the smelting industry grew, new processes were invented, and new sypes of ores were found. It certainly seems desirable that the rates and schedules should be simplified in order that they may be more comprehensible to shippers of ores, particularly the small shipper who often is not familiar with the intricacies of the business and hence is not in a position to know whether justice is done him

There is little question but that the principles upon which the rates and schedules are founded are just enough. However, individual deductions and charges for smelting might not be so reasonable. At first sight it would seem that when lead is worth 4.7 cents per pound, a deduction of over 60 per cent of this value to cover smelting, refining and freight is too much. Determination can not be made superficially, but there is no question but that, per ton of metal recovered, the smelting of low-grade lead or copper ore is much more costly than that of high-grade ore

Another point of contention relates to the deduction for silica and the bonus for iron when ore is purchased on the neutral schedule. Frequently the penalty for excess silica is 12 cents and the bonus for iron is 10 cents. It is claimed that the penalty and the bonus should equal each other. This claim is perhaps reasonable in copper smelting, in which the unit of silica is about equivalent to a unit of iron, but in lead smelting two units of iron plus lime are needed to be equivalent to one unit of silica, so that it seems fair to make the penalty on silica higher than the bonus for iron. However, in many contracts at the present time the bonus and penalty figures are equal. It is customary for a shipper who controls a considerable ore supply to enter into contract with the smelting company for the treatment of his ores. In instances of this kind, which are frequent, much better rates and schedules are often obtained than are specified in the so-called open schedules, which are published for the shipper of small isolated lots. Rates also vary, the variation being dependent on the demand for certain kinds of ore. Thus, at times the siliceous or "dry" ores are scarce and again ferruginous ores are scare, so that rates vary with the supply.

AN IMPORTANT BUSINESS

"The buying and selling of ores and metallurgical products is a great and highly important business in the United States, and one that concerns not only the miner and the metallurgist but the industrial world in general. In this paper the attempt is made to outline clearly its underlying principles, the subject matter being based on personal experience and investigation. The author has endeavored to present the material impartially, and for that reason many of the statements and figures regarding metallurgical practice should be taken as illustrative rather than as applying exactly to average operating conditions. Moreover, the statements as to metal prices and trade methods are to be considered as applying to normal business, not to special conditions that have developed as a result of the war in Europe. As regards the style, technical words and phrases have been avoided as much as possible in order to make the paper easily understood by anyone who might be interested.

"In estimating the value of an ore or any intermediate metallurgical product (other than a refined metal) the basis used is the price of the refined metal at some principal market center, such as New York, at the time the valuation is made. The average price of all copper for 1913 was 15.5 cents per pound, and for electrolytic copper 15.269 cents per pound. The prices for other metals for the year 1914 were as follows: Lead, 3,862 cents per pound; spelter, 5.213 cents per pound; silver, 54.811 cents per troy ounce. Gold has the standard value, established by law, of $20.67 per troy ounce.

"If the metal contents, in pounds for the base metals and in troy ounces for the precious metals, per avoirdupois ton be multiplied by the prevailing price of the refined metals, the sum of the products will be the gross value of the ore.

"There is, however, a wide difference between the gross and the net value of a tone of ore. From the gross value must be deducted, first, the total cost of mining the ore, and then the total cost or charge for treatment, which includes some or all of the following items: Freight to treatment plant, milling or smelting charge, charge to compensate for losses of metal in treatment, charge for penalties imposed on undesirable constituents in the ore, charge for freight to refining center, charge for refining the metal, charge to cover the selling costs of the refined metal. Which of these charges are imposed and what the amount of each charge is depend on the ore, the method of treatment, and the number of firms that handle the ore and metals in the process from ore to refined metal.

"The types of companies that handle ores and metallurgical products may be classified as follows:

"1. Mining and smelting companies or mining and milling companies, which control all the operations from the mining of the ore to the production and selling of the finished metal

"2. Mining companies, which mine and sell ore on certain schedules to smelting or milling companies

"3. Custom smelters or mills which purchase ores and also (a) operate refineries and produce refined metals or (b) sell intermediate metallurgical products to refineries

"Concerns of type 3 may control mines that furnish a part of their ore supply.

"4. Refining companies, which purchase metallurgical products such as matte, and crude metals, and some ores, and produce refined metals

"5. Selling agencies, which place the refined metals on the market

"It is apparent that an ore or the products derived from it may go through many hands before the finished metal reaches the market, and that metallurgical business may be complex. In the following pages the essentials of the commercial side of metallurgical work are discussed in some detail

COMPOSITION OF ORES

"It is most important to know the contents of an ore in gold, silver, copper, lead, and zinc, if any or all of these metals be present In smelting work such other constituents are determined as may be necessary to make proper smelting mixtures Analyses of ores are made to determine silica, iron, alumina, lime, and, less often, magnesia, barium, sulphur, and arsenic Many other substances may be determined as occasion demands

"In gold and silver milling work it is usually unnecessary to make analyses of the ores except to determine gold and silver, although sometimes it is desirable to know the other constituents of the ores, particularly as regards the presence of elements or compounds such as copper, lead, zinc, tellurium, selenium, sulphur, arsenic and antimony, that interfere with the extraction of the precious metals In lead and copper smelting however, it is essential, in order to control smelting operations, to know within narrow limits the proportions in the ores and flux of silica, lime magnesia, alumina, sulphur, and iron, aside from the metallic contents for which the operations are conducted These facts make a chemical or assay laboratory an essential part of a smelter or mill This laboratory must furnish the requisite data promptly on short notice in order that the technical operations of the plan may be properly guided Such laboratories daily turn out a great many routine analyses with accuracy and dispatch

SAMPLING, BUYING AND SELLING

"In order that assays and analyses may be of value, the samples assayed must truly represent the lots of ore, the value and composition of which it is desired to know For this reason it is necessary to sample given lots of ore as they come to the mill or smelter. If ores or metallurgical products such as matte, pig or blister copper, or lead bullion are sold by one company and purchased by another, accurate sampling is essential Consequently reliable methods of sampling such products have been devised. If a company both mines and treats its ores careful sampling may not be necessary, but in most instances will be desirable, in order to verify the technical work and aid in the accounting In order to facilitate the selling and buying of ore public sampling and ore purchasing companies have been established. Such a company acts as a disinterested party between buyer and seller, sampling the ore for a fixed charge per ton

PRACTICE AT CRIPPLE CREEK

"As an example of how transactions in ore are conducted, the practice at Cripple Creek, Colo., may be cited The shipper who sends his ore under contract to a milling company has the right to sample his ore in any of the public sampling works at his own expense. He may then either sell the ore to the sampler, who buys it under the milling company's contract rates or he may reconsign it to the milling company direct where it is again sampled, the results of this sampling becoming the basis of settlement for the ore In any event all ore passing through the sampling works on contract must go to the mill holding the contract Ore that is reconsigned and not purchased by the sampling company is sampled for 60 cents a ton, but if it be purchased by the sampling company the charge is $1 a ton As to ore not under contract the owner has the choice of either selling it to the public sampling works or shipping it directly to the mills or smelter

"The deductions for treatment made by a sampling company are governed in every instance by those quoted by mills and smelters, as the sampling company has no other outlet for the purchased ore. Public sampling companies give the ore shipper the advantage of having his ore sampled in the camps and purchased by the sampler under mill or smelter contract and of receiving his money several days earlier than if he ships directly to the mill or smelter.

"By reason of the fact that the public sampling companies have no other outlet for ores purchased than the mills or smelters, it is obvious that such companies are more or less governed by the methods employed by the smelters and mills. This statement applies generally throughout the West to the sampling of gold, silver, lead and copper ores. The real function of the public sampling works is to aid the miner and the smelting and milling companies.

"There are public sampling works at Cripple Creek, Georgetown, Idaho Spring, and Central City, Colo.; in the vicinity of Salt Lake City, and at Ogden, Utah; at Millers and Hazen, Nev.; at Butte, Mont.; and at San Francisco, Cal.

SAMPLING BY MILLING COMPANIES

"All well-regulated custom milling and smelting companies maintain their own sampling departments. The ore received is sampled and the results obtained from the basis on which the ore is purchased. This procedure is strictly followed whether the ore has been sampled once or a number of times before being shipped to them.

"At present the general attitude of the ore seller, in regard to sampling, appears to be one of satisfaction. Occasionally, of course, some individual shipper complains but in general complaints are not common.

"The facilities afforded by the public sampling companies and the mills and smelters for the sampling of all classes of ore have been developed to a high degree of efficiency.

METHOD OF SAMPLING ORES

"No mill or smelter can treat each lot of ore separately. Such a procedure would be impossible because of cost and of technical difficulties. If separate treatment were possible, sampling might be unnecessary, for then the product of the operation on a given parcel of ore, or the value of the ore, could be turned over to the seller. But as this procedure is impossible the only method of determining the amount of valuable metals in the parcel of ore is by sampling, as above outlined

"Sampling formerly done by hand labor and by crude methods, often inacurate, is now largely done by automatic machinery. A considerable part of the ores sampled by mechanical means is usually crused fine. Such crushing is undesirable if the ore is subsequently to be smelted in the blast furnace. For this reason lead-smelting plants, which must treat all ore, whether coarse or fine by blast-furnace smelting, still practice the so-called hand sampling of oxide ores. The ores received by the lead smelter are broadly divided into two classes, sulphide ores and oxide ores. The sulphide ores, which must first be roasted and sintered (agglomerated) before smelting, are of necessity crushed fine, in order to facilitate roasting. The oxide ores, however, need not be crushed fine. It is customary, therefore, for lead-smelting plants to have a sulphide-sampling mill in which the sampling is conducted by standard mechanical means and an oxide-sampling mill where the sampling is done largely by the alternate-shovel method and by coning and quartering, in which only a relatively small part of the ore is crushed.

"The charges for the sampling are comparatively small (25 cents to $1 per ton) and are no burden in return for the benefits received.

"The final sample is a small part of the original lot of ore; perhaps one part in 60,000 to 30,000. The final sample is usually divided into four equal parts, which are placed in paper sacks and distributed to the interested parties, one being retained for reference. Glass bottles, instead of paper sacks, are used for sample containers by some companies.

"The practice followed in settling for ores after the metallic content has been ascertained is to split the results of the assays of the shipper and purchaser according to a previously arranged plan. On a gold ore, for example, assaying between 1 and 2 ounces, the practice is, if there be a difference of two to five points (0.0. to 0.05 ounce), to take the average, or "split the difference," of the two assays. If the ore contains 2 ounces or over, the allowance is four points (0.04 ounce), the purchaser and seller splitting this difference. If the purchaser's and seller's assays do not agree close enough to permit splitting the difference, a sample is submitted to some reliable independent assayer for an 'umpire' determination. Should the result of the umpire fall between that of the two disagreeing assays, his assay is taken as a basis of settlement, the interested parties sharing in the cost of the umpire's services. On the other hand, should the umpire assay be lower or higher the assay result nearest the one obtained by the umpire is then taken as the basis of settlement, and the cost of the umpire is paid by the one whose assay results were rejected.

"The umpire assayer is usually chosen by agreement between the ore buyer and the ore seller. In drawing ore contracts specifying the terms under which ore is bought it is customary to name three reliable assayers of reputation, satisfactory to both parties of the contract, from which the umpire assayer for any particular lot of ore may be selected. Frequently the ore purchaser, either a smelting or a milling company, pays the umpire, irrespective of whether the cost be assessed against the buyer or the seller of the ore. If the seller is liable for the cost, this is deducted on his 'settlement sheet,' which gives the net return on his lot of ore. Umpire assayers are sometimes criticized by the sellers of ore on the basis that no umpire assayer could exist in business if he incurred the displeasure of smelting and milling companies, as such companies receive so many parcels of ore and thus control so much umpire work that their displeasure would mean a large loss of business to the umpire. The suggestion has been made that some central authoritative board of umpires be created to finally adjudicate disputed cases.

MOISTURE IN ORE

"Smelting and milling charges are practically always based on 'dry weight,' and assays and analyses on dried samples. The ore as mined and shipped always contains a certain amount of water as 'moisture.' The water in the ore may be present in two forms—as moisture or mechanically contained water; and in some instances in part as chemically combined water or 'water of crystallization,' this water entering into the chemical constitution of some minerals, such as kaolin and alunite.

"The ore may be rather wet when mined or may become wet in transit from mine to reduction plant. Although water of crystallization is a fixed unvariable quantity and is part of the ore, 'moisture' is a variable quantity, its fluctuations depending on the wetness of the mine and on weather conditions. Assays and analyses of two undried samples of the same ore rarely agree, as one of the samples may undergo some drying in transit and for this reason give higher results per unit weight than the wet sample assayed at once at the mine where it was taken.

"The practice therefore is to weigh the ore at the sampling plant immediately before sampling. This weight is called the 'gross weight of the ore. Then the ore is sampled, the sample is weighed and is dried in a steam bath at about 212° to 250° F., until the moisture is driven off. The weight is determined and the percentage of moisture removed is calculated. Deducting the calculated moisture from the gross weight gives the 'net weight' of the lot of ore to which the metal content of the dried sample corresponds. The temperature of drying is not carried beyond 212° to 250° F., in order that no water of crystallization may be removed. Water of crystallization is not expelled until a higher temperature is reached, and failure to expel all of it introduces another variable. The moisture in ores varies greatly, from about 2 to 30 per cent and more, according to the nature of the ore. Solid, hard, quartzose ore has the lowest moisture content, whereas clayey ore may contain a large percentage. It is evidently to the advantage of the shipper to ship ore as dry as possible, as freight is paid on gross weight and the shipper receives no return for the water content. Water may be and is often absorbed in large quantities by ore shipped in open cars and the ore must be weighed before sampling, rather than to depend on railroad shipping weights at the point of origin.

"It is still a common practice to collect a 'grab' moisture sample in addition to the regular sample, by taking indiscriminately a number of shovelfuls from the lot of ore on the assumption that moisture is lost during sampling and that a moisture determination on the final sample will result in crediting the shipper with too large a net weight. Such a haphazard method of determining moisture is usually inaccurate and should be discarded as unfair. The moisture in ore is chiefly in the fine part, and a 'grab' sample may contain an undue proportion of fine material. The moisture lost during the principal sampling operation can be allowed for by a correction. In Colorado experiments have shown that the loss in moisture during machine sampling is about 10 per cent in summer and 7 per cent in winter; that is, ore showing 5 per cent of moisture in the machine sample, actually contains 5.5 per cent during summer conditions. Hence moisture should be determined in the regular sample and the proper correction allowed for.

"The moisture content of ores is a frequent source of dispute and discord between buyer and seller, for no direct redetermination or resampling is possible, as is for the metal content, though the ore lot may be reweighed and this weight compared to the original wet weight and the percentage of moisture arrived at in this way.

ASSAYS AND ANALYSES

"As already stated, all such assays for gold and silver and other precious metal, and all such analyses for copper, lead, zinc, and other substances as may be necessary, are made on the dried sample. The precious metals, gold, silver, etc., are determined by means of the fire assay, and other metals and constituents by wet chemical analysis. The fire assay for gold, silver, etc., can be made with great accuracy, so that in the regular commercial work carried on daily in assay laboratories, one part gold in 3,000,000 parts ore, and one part silver in 300,000 parts ore are readily determined. One part gold in 2,916,600 parts ore represents 20 cents in a ton of ore. Assays of samples must agree within 20 to 60 cents in ores not exceeding $40 in value; a greater difference is permissible for higher grade ores. Silver is usually required to check within one-half to 1 ounce per ton. The troy ounce is the standard by which all precious metals are sold. The standard weight of ore in the United States is the avoirdupois ton of 2,000 pounds. The relation between troy and avoirdupois weight is found in the figures that 1 ton avoirdupois contains 29,166.6 troy ounces.

"The assayer, therefore, adopts as a unit weight in the laboratory the assay ton, which contains 29,166.6 milligrams, equal to 29.166 grams. With this standard weight of ore taken as a sample, every milligram of gold recovered therefrom represents an ounce troy per ton avoirdupois of ore. Assay balances weigh readily to 0.005 milligram, so that the determination of gold to 0.01 milligram, equivalent to 0.01 ounce, or 20 cents gold, is not difficult. Accuracy may be increased by taking sample weights that are multiples of the assay ton.

"In the British Colonies gold is estimated in ore as ounces, pennyweights, decimal parts of a pennyweight, and also as grains per ton of 2,000 and of 2,240 pounds; in Mexico, as grams per metric ton (2,204.6 pounds), or as grains per short ton, or as ounces per short ton as in the United States. Copper, lead, zinc, and other constituents are determined as percentages. Thus, copper ore containing 10.10 per cent copper will contain 202 pounds of copper per ton. One per cent per ton, equivalent to 20 pounds, is frequently termed a unit, and payment for copper and lead is sometimes made on the unit basis. In commercial work the metals are usually determined to within 0.05 to 0.20 per cent, although sometimes greater accuracy is required. Other substances in the ore, as silica, lime, iron, and alumina, the amounts of which must be known in order to direct technical operations, are determined by rapid methods."

CARL SCHOLZ PROMOTED BY ROCK ISLAND RAILROAD

Carl Scholz, president of the American Mining Congress, just has been appointed manager of the Mining and Fuel Department of the Chicago, Rock Island and Pacific Railroad. In this position he has charge of all mining operations and the purchase, handling and use of company fuel. Commenting on his promotion, the Western Trade Journal says:

"Formal announcement has just been made of the appointment of Carl Scholz, the well-known mining engineer, as manager of the Mining and Fuel Department of the Chicago, Rock Island and Pacific.

"Undoubtedly there is not a better known or more capable mining engineer in Chicago than Mr. Scholz and during the many years that he has been associated in such capacity with the foremost corporations of the country he has accomplished many large undertakings and has established a most enviable reputation. In his new position Mr. Scholz will continue to make his headquarters in Chicago. The selection of Mr. Scholz for such an important post is fitting recognition on the part of the Rock Island of the ability of a man who has given so many years of his life to the solving of mining engineering problems.

"It is remarkable the large number of men who have won promotion or appointment with railroads or organizations affiliated with traffic work during the last few years. The purpose of the directorate appears to place in the most responsible positions men who have distinguished themselves in their particular line, and the appointment of Mr. Scholz appears to bear this out. Considering the growing importance of the Rock Island in the West and the magnitude of its mining and fuel department, it is absolutely necessary that the men in charge of this department have the widest experience in engineering and be able to show results.

"Carl Scholz was born in Slawentzitz, Germany, July 2, 1872, the son of Paul and Nannette (Schneider) Scholz. He was educated in Germany, and came to America in 1890. He married Eleanor Hay Barclay, of Lexington, Va., April 22, 1897. He has served as mining engineer for the Mount Carbon Company, Ltd., Powelltown, Va., 1891-94; manager and part owner of the Thomas-Scholz Coal Company, Riverside Coal Company, Superior Coal and Lumber Company, and Carbon Coal and Coke Company, Kanawha District, West Virginia, 1894-1901; manager of the mining department of the Chicago, Rock Island and Pacific since 1902, and president and director Rock Island Coal Mining Company, Coal Valley Mining Company, and vice-president and director Consolidated Indiana Coal Company, director of the First National Bank of Hartshorne, Okla., consulting engineer United States Bureau of Mines. He is a Republican in politics, member of the American Institute of Mining Engineers, American Society for Testing Materials, Western Society of Engineers, First Aid Committee War Relief Board of the Red Cross. He belongs to the Union League and Chicago Athletic clubs, is an Episcopalian, and resides at 700 Bittersweet Place, Chicago."

For Safety's Sake, Blast With

LOW FREEZING

DU PONT

EXPLOSIVES

Especially Made for Blasting Work in Winter Weather

NOW is the time when the blasting crews experience trouble with explosives affected by chilling temperatures.

Insist that all blasting shall be done with our LOW FREEZING EXPLOSIVES. They remain un-frozen and retain their efficiency in near zero weather. *Thawing is seldom necessary.*

Tell us about your work. Let us help your crew to get better results. Write to department 234.

E. I. du Pont de Nemours & Co.
Powder Makers Since 1802
WILMINGTON, DELAWARE

PERSONALS

George Watkins Evans, of Seattle, is expected in Washington within the next few days, to consult with Secretary Lane in regard to Alaskan coal leases. Mr. Evans subdivided the Bering River field into leasing units.

E. Steidle, an engineer assistant to George S. Rice of the Bureau of Mines, will make his headquarters in Washington. Mr. Steidle had charge of the Bureau of Mines exhibit at the Panama-Pacific Exposition.

George S. Rice, chief engineer of the Bureau of Mines, who recently moved his headquarters from Pittsburgh to Washington, made a business trip to Pittsburgh last week.

Charles Enzian in the readjustment of the Pittsburgh office of the Bureau of Mines will be chief assistant to Geo. S. Rice, directing all coal mine investigations.

Chris Damm, a mining man formerly operating at Nome, but now at Lillouet, British Columbia, has been in Washington on a short business trip.

Sumner S. Smith, of Alaska, mine inspector for the Bureau of Mines, is in Washington for a conference with the Secretary of the Interior regarding Alaskan coal leases. Mr. Smith has subdivided the Matanuska field into leasing units.

H. M. Wolflin has assumed his duties in the newly created position of safety engineer at the Pittsburgh office of the Bureau of Mines. Mr. Wolflin will have charge of all rescue work in addition to certain other duties which devolve upon the office.

J. W. Paul, who has been in charge of the mine rescue work at the Pittsburgh office of the Bureau of Mines, has resigned and has begun consulting practice in safety and coal mining engineering, with his office at Pittsburgh.

Harry E. Kelly, formerly of the Denver bar and at one time United States attorney for Colorado, has resigned as attorney for the Interstate Commerce Commission to become a member of the legal firm of Cassoday, Butler, Lamb & Foster, of Chicago.

S. W. Wetherill has purchased 1,100 acres of zinc lands in Hancock County, Tennessee. It is understood that the consideration was $2,000,000. Few prospects have been opened in this area, but its value has been recognized for many years. Extensive development is anticipated.

Dr. G. Odell will leave Washington this month on a prospecting trip in Colombia. He will be accompanied by a party.

B. Bryan, mining engineer, who has confined his practice largely to Central and South America for the last ten years, is in the United States on a business trip. Mr. Bryan was graduated from Stanford University. He has made extensive trips recently through Western Colombia, where mining regions of great promise exist. He formerly had charge of the geological staff of the Barber Asphalt Company, in Venezuela. He also is interested in the Collahuasia Copper mines in Chile.

Whitman Cross, of the United States Geological Survey, one of the geologists who has been looking into the causes of slides in the Panama Canal, has returned to Washington.

J. C. Branner, formerly president of Stanford University, was in Washington recently after having visited Panama and several of the Caribbean Islands.

C. H. Gibbs, of Salt Lake, geologist of the Utah Fuel Company and also owner of the Consolidated Mines Company at Alta, Utah, was in Washington several days last month. Mr. Gibbs also is the owner of some very impressive appearing molybdenum mines near Alta.

Falcon Joslin, of Fairbanks, Alaska, formerly a director of the American Mining Congress, is in Washington on business.

Anaconda Commission Meets

A meeting was held in Washington last month of the Anaconda Smelter Commission. It consists of John Hays Hammond, L. D. Ricketts and Van H. Manning. Only routine business was transacted, of which no announcement was made.

Cable Address, "Dilogue" Code, Bedford McNeill

THE
ASSOCIATED GEOLOGICAL
ENGINEERS

F. G. CLAPP and M. L. FULLER,
Managing Geologists

*Examinations and Reports on Oil
and Gas Properties*

1113 Equitable Bldg. NEW YORK CITY
131 State St. BOSTON, MASS.
1333 F St. WASHINGTON, D. C.
531 Fourth Ave. PITTSBURGH, PA.

AMERICAN MINING CONGRESS

OFFICERS AND COMMITTEES, 1916

OFFICERS

Carl Scholz, President
Harry L. Day, First Vice President
M. S. Kemmerer, Second Vice President
James E. Talmage, Third Vice President
J. F. Callbreath, Secretary

EXECUTIVE COMMITTEE

Carl Scholz
Chas. M. Moderwell
Walter Douglas

DIRECTORS

W. J. Richards, Pottsville, Pa.
Dr. Jas. E. Talmage, Salt Lake City, Utah
Chas. M. Moderwell, Chicago, Ill.
Dr. Wm. B. Phillips, Golden, Colo.
M. S. Kemmerer, New York City
E. A. Montgomery, Los Angeles, Cal.
Samuel A. Taylor, Pittsburgh, Pa.
L. A. Friedman, Lovelock, Nev.
Carl Scholz, Chicago, Ill.
Harry L. Day, Wallace, Idaho
Charles S. Keith, Kansas City, Mo.
Walter Douglas, Bisbee, Ariz.

COMMITTEES, 1916

STATE VICE-PRESIDENTS

Alaska	B. F. Millard	Valdez
Arizona	W. B. Twitchell	Phoenix
Arkansas	C. C. Woodson	Huntington
California	Charles E. Knox	Berkeley
Colorado	Irving T. Snyder	Denver
Georgia	W. H. Fluker	Thomson
Idaho	James F. McCarthy	Wallace
Indiana	J. C. Kolsem	Terre Haute
Illinois	F. W. DeWolf	Urbana
Kansas	Joseph Fletcher	Frontenac
Michigan	Charles E. Lawrence	Palatka
Missouri	W. B. Shackelford	Webb City
Minnesota	F. O. Hammer	St. Paul
Montana	James L Bruce	Butte
Nebraska	Frank A. Manley	Omaha
New York	Charles H. Smith	New York City
Nevada	C. B. Lakenan	McGill
New Mexico	T. H. O'Brien	Dawson
Ohio	W. R. Woodford	Cleveland
Oregon	Harold N. Lawrie	Portland
Oklahoma	Dorset Carter	McAlester
Pennsylvania	Morris Williams	Philadelphia
South Carolina	H. L. Scaife	Clinton
Texas	D. C. Earnest	Dallas
Virginia	E. A. Schubert	Roanoke
Wisconsin	F. O. Granberg	Oshkosh
Wyoming	W. D. Brennan	Cheyenne
West Virginia	Ernest Chiison	Rush Run
Washington	Col. W. T. Perkins	Seattle

REVISION OF MINERAL LAND LAWS

E. B. Kirby, St. Louis, Mo., *Chairman*

L. V. Ray	Seward, Alaska
Will L. Clark	Jerome, Ariz.
E. H. Benjamin	San Francisco, Cal.
Victor C. Alderson	Denver. Colo.
J. H. Richards	Boise, Idaho
Wm. Scallon	Helena, Mont.
Horace V. Winchell	Minneapolis, Minn.
E. B. Kirby	St. Louis, Mo.
D. C. McDonald	Ely, Nev.
C. T. Brown	Socorro, N. Mex.
[illegible] Broman	Austin, Tex.
W. H. King	Salt Lake, Utah
L. K. Armstrong	Spokane, Wash.
Edwin Hall	Lusk, Wyo.

SPECIAL COMMITTEE ON REVISION OF MINERAL LAND LAWS, TO ACT WITH SIMILAR COMMITTEES FROM THE AMERICAN INSTITUTE OF MINING ENGINEERS AND THE MINING AND METALLURGICAL SOCIETY OF AMERICA

E. B. Kirby, St. Louis, Mo., *Chairman*

George E. Collins	Denver, Colo.
Will L. Clark	Jerome, Ariz.
George Wingfield	Reno, Nev.
Thomas S. [illegible]	San Francisco, Cal.

ALASKA AFFAIRS

Falcon Joslin	Fairbanks, Alaska
George C. Hazelet	Cordova, Alaska
M. D. Leehey	Seattle, Wash.
William Griffith	Scranton, Pa.
T. P. McDonald	Helena, Mont.

WORKMEN'S COMPENSATION

T. L. Lewis, Charleston, W. Va., *Chairman*

David Ross	Springfield, Ill
Hon. Thomas Kearns	Salt Lake City, Utah
W. R. Woodford	Cleveland, Ohio
J. C. Kolsem	Terre Haute, Ind.

UNIFORM MINE REPORTS

Samuel A. Taylor, Pittsburgh, *Chairman*

E. T. Bent	Chicago, Ill.
J. C. McKinley	Wheeling, W. Va.

CONFERENCE WITH FEDERAL TRADE COMMISSION

Charles M. Moderwell, Chicago, *Chairman*

Hugh Shirkie	Terre Haute
M. S. Kemmerer	New York
Harry N. Taylor	Kansas City
F. S. Landstreet	New York City

STANDARDIZATION OF ELECTRICAL EQUIPMENT

In Coal Mines

Geo. R. Wood, Philadelphia, Pa., *Chairman*

S. A. Taylor	Pittsburgh, Pa.
J. R. Bent	Oglesby, Ill.
G. T Watson	Fairmont, W. Va.
H. M. Warren	Scranton, Pa.
G. A. Schreier	Divernon, Ill.
W A. Thomas	Pittsburgh, Pa.

In Metal Mines

H. S. Sands, Denver, Colo., *Chairman*

C. A. Chase	Denver. Colo.
Sanford B. Belden	Columbus, Ohio

MINERAL STATISTICS

Otto Ruhl, Joplin, Mo., *Chairman*

Fred'k Burbidge	Spokane, Wash.
J. C. Dick	Salt Lake City, Utah

FORESTRY RELATIONS

Carney Hartley, Denver, Colo., *Chairman*

F. J. Alexander	Denver, Colo.
C. H. Gibbs	Salt Lake City, Utah
William McDermott	Tucson, Ariz.

MINE TAXATION

In Metal Mines

D. L. Webb	Denver, Colo.
Prof. L. A. Young	Urbana, Ill.
John Wellington Finch	Denver, Colo.
D. W. Brunton	Denver, Colo.
John M. Hayes	Salt Lake City, Utah

BUREAU OF MINING ECONOMICS

S. D. Warriner	Philadelphia, Pa.
F. S. Peabody	Chicago, Ill.
B. F. Bush	St. Louis, Mo.
D. W. Brunton	Denver, Colo.

LIBRARY
MAR 1 1916

THE MINING CONGRESS JOURNAL

SAFETY—EFFICIENCY—CONSERVATION

VOL. II

No. 3

MARCH, 1916

VAN H. MANNING

The mainspring of the Safety First Exhibition

PUBLISHED BY
THE AMERICAN MINING CONGRESS
PUBLICATION OFFICE
MUNSEY BUILDING WASHINGTON, D. C.

$ 2.00 PER YEAR

20 ¢ PER COPY

WILMOT ENGINEERING CO.

Works, White Haven, Penna. HAZLETON, PENNA.

MANUFACTURERS OF

HIGH GRADE MACHINERY

FOR THE PREPARATION AND HANDLING OF

ANTHRACITE COAL

WILMOT RIVETLESS CHAINS for Conveyors for Elevators for Car Hauls

LLOYD COMPOUND (HOLLOW GROUND TOOTH) **ROLLS**

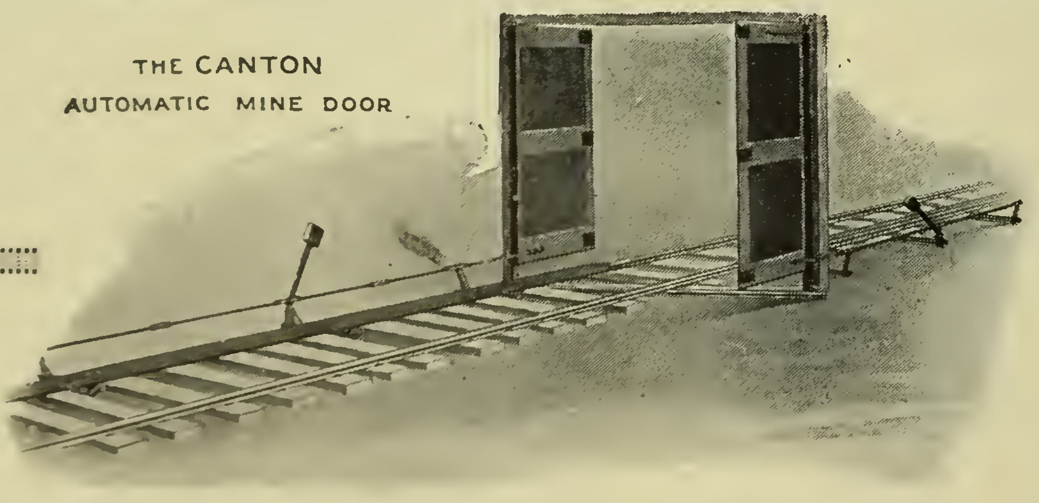
PARRISH Flexible Arm **SHAKERS**

SIMPLEX JIGS

handling
crushing
screening
cleaning

BEST SERVICE—LONGEST LIFE—LOWEST COST OF UP-KEEP

Let us figure with you on your new installation or replacing your old and obsolete ones



IMPROVED METHODS

Without Additional Expense

IF you contend for old time methods, you might try keeping time by employing a boy with a hammer and gong, to strike off the hours as indicated by a sun dial. ¶ A trial, however, will convince you that a good clock is cheaper and more reliable. ¶ So is the Canton Automatic Mine Door better than a trapper boy. ¶ Write for literature.

THE AMERICAN MINE DOOR COMPANY, Canton, Ohio

To the Members of the American Mining Congress:

Do you know that you are the owners and publishers of the MINING CONGRESS JOURNAL? We trust you will realize the responsibility of this ownership and that you will lend your active assistance in making the Journal a greater success.

Real mining men should be active members. An application blank will be found on another page of this issue.

Associate memberships are designed for those not actively interested in mining, but who are willing to assist a state Chapter of the Mining Congress in helping to develop the Mining industry within the State. All memberships include subscription to the MINING CONGRESS JOURNAL.

Every member of the Mining Congress should undertake to send in at least one application each month. Will you help by having the following blank filled in and mail to this office?

SUBSCRIPTION AND APPLICATION FOR ASSOCIATE MEMBERSHIP
IN THE

AMERICAN MINING CONGRESS

....191.......

I hereby make application for Associate Membership in THE AMERICAN MINING CONGRESS, and agree, if accepted, to abide by the By-Laws, Rules and Regulations of said organization and to pay the dues required by same. Herewith find $1 00 fee and $2.00 dues for one year, including subscription to the Mining Congress Journal ($1.00 of which is designated as subscription to Journal).

Name..

Occupation ....

P. O. Address...

....

Recommended by ....

DELEGATES TO THE MEETING OF STATE MINE INSPECTORS HELD IN WASHINGTON, FEBRUARY 24 AND 25

VOL. 2, NO. 3 WASHINGTON MARCH, 1916

THE MINING CONGRESS
JOURNAL

Official Organ of the American Mining Congress

SAFETY FIRST EXHIBITION ELICITS PRAISE OF PRESIDENT AND 35,447 VISITORS

Conference of State Mine Inspectors and Other Delegates Results in Strong Movement to Standardize State Laws and Regulations Affecting Coal Mining Throughout the Country.

A long step toward obtaining standardization and uniformity among the States in mining laws and mining practices was taken at the convention in Washington last month of State mine inspectors and others particularly interested in this phase of the mining industry.

At the request of the Secretary of the Interior mine inspectors and other delegates were sent from many of the coal and metal mining States to be present at the conference, which was a part of the program of Safety-First Week.

Under Government auspices twenty-five bureaus staged an exhibition which set forth graphically the safety-first work each is doing. Naturally the central position in a movement of this kind was taken by the mining industry, in which the life loss has been reduced decidedly by such methods.

Among the 35,477 persons who attended the exposition were a large number of mine operators. This is taken to indicate that the point has been reached where the mine operator is interested in safety methods as much as is anyone else.

Without question the best exhibit was that of the Bureau of Mines. In the very front was a large map on which the offices of the Bureau and the experiment stations being conducted by it, as well as the points where mine rescue cars are stationed were indicated by a different colored electric light.

Breathing apparatus mounted upon dummies clothed in characteristic mine costume attracted a great deal of attention.

Other features of the exhibit were: mine signal horns, lung motors, first-aid cabinets, oxygen resuscitators, fire damp detectors and first-aid lamps of various kinds.

A bird cage containing an imitation canary together with an explanation showing the use of the canary in detecting dangerous mine gases, attracted much attention.

One of the features of the Bureau's exhibit was the display of radium. Two dark rooms were provided, which were open to the public, in which various of the optical features of radium were displayed.

Large crowds were attracted to the exhibit by the demonstrations of breathing apparatus in actual use. One of the Bureau's experts explained the use and advantage of the various types.

Much interest was shown in a model of rock dust barriers showing how the impact of an explosion cannot pass through the clouds of rock dust which are showered down by the air pressure caused by the explosion.

Very little of the Geological Survey work has a bearing upon safety. No effort was made by this Bureau to contribute a large exhibit. It did have, however, a representative display of maps, levels, theodolites, alidades, transits, bench lamps and posts, aneroid barometers, steel tape and rods.

The Survey lays claim to being of important service toward saving life in its work of educating the public as to the dangers of a contaminated water supply. To this end some very clever drawings were on exhibit, showing how contaminated water may flow for a long distance through certain kinds of rock without being purified.

On account of the lack of uniformity in the statistical reports published by State agencies, and the multiplicity of reports required by various Federal bureaus and State departments from the operator, there is an urgent need to consolidate the various reports and standardize the manner in which these reports shall be published, and for this reason the meeting of mine inspectors was called.

FISCAL YEARS

There are fiscal years ending in May, June, September, October, and November, in addition to the calendar years. It would simplify matters very materially if it were possible to bring about a calendar year for all official reports. If it is impossible to establish a calendar year, reports should be so published as to break in six months' or three months' periods, and then, by consolidating, a calendar year may be obtained. Thus, a State whose year ends June 30 might easily prepare its reports so as to represent six months' periods, and then statisticians and others interested could combine the last six months of a fiscal year with the first six months of the following fiscal year and thus produce a calendar-year report. Those whose reports are for years ending September 30 could accomplish the same result by preparing their reports covering quarterly periods.

NUMEROUS REPORTS

The various mining companies are now flooded with requests from Federal bureaus and State organizations for information relating to their operations. Many of these requests call for practically the same information but put up in somewhat different form, so that it really necessitates compiling the figures anew from the original records. The requirements are so at variance with each other that it is difficult to keep records that will suit the needs of all. Furthermore, requests for information come at the close of the year, and, perhaps, call for data that has not been kept by the operator. With standard forms adopted, the operator would know just what would be required of him at the close of the year and would keep his records accordingly.

The following abstract from the *Black Diamond* of February 12 was called to the special attention of the meeting:

"Today the average mine must make seventeen reports to State and Federal authorities. We will not attempt to enumerate them, but will merely indicate their character. One goes to the local inspector, another to the chief inspector of mines of the State, a third to the State Geological Survey, a fourth to some State department, a fifth to the Bureau of Mines, a sixth to the United States Geological Survey, a seventh to the Government intended for the revenue collector, etc. Each of these seventeen reports is different, although all embody about the same class of information.

"In addition, the reports have to be made out at many different times. Some are made every day, some every week, some every month, some for the year ending June 30, and some for the calendar year.

"This matter of reporting on mine operations is getting to be a nuisance. It is taking entirely too much time at the mines to get up the reports, and, for the amount of time involved, far too little use is made of the information after it has been compiled. That is, the mine operator makes a report, but the summary of it comes out too late for him to use the information. This amounts to a tremendous waste of money and effort.

"There is a way by which these reports can be consolidated and made of some use to the coal operator. That is, one report, very complete in every detail, could be sent to a central organization. This central organization could compile a statement to be used by the operators and by all the State and Federal authorities."

COOPERATION

Since the organization of the Bureau of Mines it has been its policy to cooperate wherever possible with the officials representing the State organizations. It has been felt that while the Bureau is able to collect certain statistical information from the operators direct, yet such reports are rendered voluntarily by the operator and in many cases are not as complete as they should be. A cooperative arrangement will have the benefit of being backed by the State laws which require the State officials to collect, and also require the mine operators to report, certain information relating to labor, accidents and production. If this data could be consolidated and standardized it could be used by the State organizations as well as by the Federal Bureaus. It would reduce the labor on the part of the operator in preparing several reports, lend the State departments whatever assistance the Federal Government may offer, and furnish the latter with figures which will be comparable, and, in fact, the same as those published by the State officials, thus avoiding the possibility of two reports being issued which will be at variance with each other.

With the enactment of the compensation laws more detailed information is being required of the operators, and this adds another commission to whom the reports are to be submitted. The requirements of the States and Federal Bureaus should, therefore, be so standardized that one report may be made to meet the requirements of the State compensation commissions, State inspectors, the Federal Bureau of Mines, and any other agency interested in mineral statistics.

In opening the first session of the mine inspectors' meeting, Mr. Manning said:

"This meeting was called for two purposes, and I want a full, frank, and free discussion of all subjects brought before the meeting. What we want is constructive criticism. The Bureau of Mines has provided suggested forms for mine statistics. This is presented to you in concrete form so that you will have something to go on. The Bureau of Mines has accepted the form of statistics prepared by the State of Pennsylvania, and it is thought that the Bureau ought to aid the State inspectors, industrial commissions, and other societies in adopting a standard form for statistics.

"The Interior Department, Department of Labor, and Department of Commerce are three large Government agencies engaged in collecting these statistics annually.

"The second purpose for which this meeting was called is to discuss informally with you the advisability of having a standard law for all

States so far as may be possible. This is a big job and it will take some time to get anything accomplished. As you know, many miners are migratory; they are here today and gone tomorrow; they are foreign-born, many of them, and do not read or write the English language so I do not know how far it will be possible for us to go. I understand that some of the States prescribe certain forms for collecting statistics, but in a very large measure they leave it to the inspector. This is a get-together meeting and I want to hear from all of you and the meeting is now open for discussion on these matters. I have furnished you gentlemen a copy of these suggested forms. I have prescribed here an order of business and if there is no objection on your part we will take that up and discuss it so that you will have something before you."

In explaining the need for uniform statistics and the advisability of compiling them for the calendar year, Albert H. Fay, statistician of the Bureau of Mines said:

"Legislative enactments relating to mine inspection and workmen's compensation in the various States are far from being uniform. One point of difference is the year covered by the report. A number of the States have fiscal years coinciding with the calendar year, whereas in other States the fiscal year ends in May, June, September, or November. With years covering such varying periods, it is not easy to classify matter relating to the mines so that information reported by one State will be comparable with that reported by another State. It would seem, therefore, that an effort should be made to have all of the reports coincide with the calendar year.

"Many other features of the reports are not uniform. This is especially noticeable as to the classes of mines the inspection service should cover. The mines subject to inspection differ; in some States all mines are included, whereas in others only those mines employing 5, 10, or 20 men underground are included. Compensation laws in most States apply to all mines, but in some they are elective at the option of the operator. Hence those operators who do not choose to accept State compensation will not be included in the commission's report, so that the report will not include all mines for the year in question.

"The forms contained herein are submitted for the consideration of the mine inspectors and the representatives of industrial commissions with the hope that they will be of aid in establishing a uniform system for recording and publishing data relating to the mining industry, with special reference to the various phases of mine accidents.

"In order that statistics may be of greatest value to the mining industry at large, they must be collected and tabulated on a standard basis. With the introduction of compensation laws, it is absolutely essential that accurate and reliable data be available in order that proper insurance rates may be established. Furthermore, uniform and complete details offer the inspectors, miners, operators, and all others interested an opportunity to make true comparisons as to conditions in other States and with other mines in the same State or district."

ADVOCATES CALENDAR YEAR

A. W. Donovan, Chairman of the Massachusetts State Board of Industry, said:

"I am firmly convinced that the time for all to close statistical reports is December 31, and my basis would be from the fact that the Federal Government is now asking all of the business houses and corporations to send in a report on the Federal income tax. That is sent in under the auditor's signature, in most cases, and the sworn statement, and for once in the year most of us have a sworn statement of the exact condition of the business, and from that particular time it would appear that it is much better than closing the fiscal year in May, June, September, or July; and from that record we would all have, as you suggested, a particular day and particular time from which to get our figures and statistics. I am very much in favor of the thirty-first day of December."

SITUATION ON NEW YORK

L. W. Hatch, chief statistician of New York State Industrial Compensation Commission, said:

"We are coming to feel that the calendar year is the thing we should come to. I imagine that our problem in arriving on the calendar year as the report is quite similar to what it is in other States where the fiscal year of the departments does not correspond with the calendar year, and laws usually require an annual report to the legislature. The fiscal year in New York, for example, is fixed by the legislature for ending September 30. As the department makes its tabulations quarterly, those States having years ending in May or November will absolutely have to change their periods, but a quarterly or half-year period would enable a recomputation for the calendar year at any time. That is what we are trying to do in New York. It is possible that the fiscal years in New York will shortly be changed to end June 30. What we propose to do in New York is to probably divide our year into halves, making tabulations six months apart, and then if necessary we will have to make it quarterly as has been suggested. That will simplify our problem a good deal. I am very much in favor, myself, aside from these computations due to the requirement of law or departmental requirements, of the calendar year ending December 31."

FAVORS CALENDAR YEAR

John Bohlander, President of the Illinois State Mining Board, said:

"In Illinois we have a year ending on June 30, and while it has seemed in the past to give general satisfaction, our mines as a rule are winter mines and the summer time as a rule is the dull season. It has always in the past been better to end on June 30, but for the sake of uniformity I am in favor of using the calendar year. The other matters could be easily arranged, I think, satisfactorily. Our operators claim that they are too busy in the winter time to give us a report, but we find that there is just as much trouble in the middle of the summer to get one. So we are in favor of the calendar year."

SITUATION IN ARIZONA

G. H. Bolin, State Mine Inspector of Arizona, said:

"Arizona's year ends November 30 and it is the duty of the inspector to make a report to the Governor in detail of the work he has done in the year on December 31, but the work done during the month of December is not included in that yearly report. The reason that this calendar year ends on November 30 is that the Governor is elected every two years and it is the duty of the inspector to report to the Governor, and it is necessary for the inspector to get his report in shape to present to the Governor before the first of the succeeding year. So far as I am concerned, I believe the matter could be arranged so that the year could end December 31."

DR. SMITH'S OPINION

Dr. George Otis Smith, director of the United States Geological Survey, said:

"In speaking of the question that is now before you it seems to me that the point that has been made that the influence of the corporation taxes and the returns of the corporations must eventually have a large influence in deciding this question in favor of the statistical year being the same as the calendar year. We have been speaking of the fiscal years of this and that State, but we must also consider the fiscal years of the corporations and I think that the point can well be made that the influence of the corporation tax law will be to make the fiscal year of the corporations more generally coincide with the calendar year.

"I believe that we must be of one mind. What we want is the fullest statistical information, the least possible trouble on the part of the reporting company. That is the reason that I think has actuated the chairman in calling this meeting, the idea being that the State and Federal agencies must as far as possible cooperate.

"In our own statistical work, in connection with the production statistics we have found it economical to cooperate with many of the States. I believe at the present time we cooperate with about twenty of the State Geological Surveys and of course it will occur to all of you that one of the purposes of such cooperation is the avoidance of duplicate reports.

"Another point which appeals to us strongly is the avoidance of two sets of statistics that do not agree. It is rather embarrassing to the student of such matters to find one set of figures bearing the State seal and another set bearing the Federal seal. I think that these differences have been reduced in the past and I trust that they will be further reduced in the future.

"When it comes to standardization of any kind, of course there is a limit that is set by natural law. I doubt if all statistics of the mining industry can be secured on one blank. A limited set will be desired in connection with the mineral production of the United States, and the work of our statisticians has been along the lines of reducing the forms used, thus putting as little burden as possible on the reporting companies."

UTAH'S POSITION

J. E. Pettit, State Mine Inspector for Utah, said:

"Our State has a fiscal year ending November 30. I was called upon to address a high school class the other day. I took the State figures and before I got through one of the professors got up and submitted the Government's figures and I was asked which were correct. Of course, I had to explain that they were both correct; one was taken for the fiscal year and the other for the calendar year. I realize that it would take a whole lot of energy and time to convince our legislature to change the fiscal year of the State. I think if the statements sent out by the Bureau of Mines requesting information each month would be shaped in such a manner that the dates of such fatalities could be shown it would simplify matters for States that are situated such as ours is. Then we have this staring us in the face. For the past four years we have had more fatal accidents in the month of December than any other month in the year, and that makes quite a material difference in our fiscal year and calendar year when the fatalities are computed. I would like to suggest to Mr. Fay that it might be a good idea if the dates of the accidents were put in, so that it could be put into the reports."

THE INSURANCE ATTITUDE

H. M. Wilson, representing the insurance interests, said:

"So far as the insurance companies which are concerned in underwriting coal mine risks on workmen's compensation are concerned, the policy year is the calendar year and I am quite confident that these insurance companies will be in hearty accord with any motion to make the calendar year the statistical year. In some cases the policy year is not the calendar year, but the statistical year is the calendar year."

CLASSIFICATION OF MINES

Some interesting discussion with regard to the classifying of gaseous and non-gaseous mines took place at the first session.

J. T. Beard, of *Coal Age*, said:

"Conditions in what are called gaseous mines differ from those in what are called non-gaseous. In this classification it would be a very essential idea to start out with a thorough classification, not only of mineral mines but of coal mines, and it would have this incentive that State mine inspectors would classify their statistics along the same lines, whereas if it was just simply made out in a general way they would not fit the classification."

RICE DIFFERS

Geo. S. Rice, chief mining engineer of the Bureau of Mines, took a different view. He said:

"In Pennsylvania the gaseous condition of the anthracite mines is not due to the character of the mineral, it is due to the geologic formation; the beds are heavily pitching and that is the real important feature. I have been in some of the iron mines in New York and they are quite

(Continued on Page 142)

HALF A MILLION DOLLARS ADDED VOLUNTARILY TO PAY ROLLS IN THREE UTAH CAMPS

Increased Pay to Employes Contingent on Price of Metals—New Potash Plant To Be Erected Near Marysvale—Van Law Succeeds Carpenter—Other Utah News

By A. G. MacKenzie

Salt Lake City, February 25—Between 6,000 and 7,000 metal miners of Utah are affected by voluntary wage increases announced in three Utah camps in January and February. Some of the increases were effective as of January 1 and others as of February 1. The continuance of the increased pay is made contingent on metal prices, according to the notices given out by the companies. These advances are in addition to increases previously given to mill and smelter employes and to office forces by some of the companies.

The new scale at Bingham gives increases of fifteen cents to twenty-five cents a day to about 3,700 men, the increase to remain in effect as long as copper is twenty cents or higher, New York quotation. The principal Bingham companies joining in the increase are Utah Copper, U. S. Smelting, Refining & Mining, Utah Consolidated, Utah-Apex, Utah Metals, Bingham Mines, Ohio Copper.

Tintic and Park City have announced an increase of twenty-five cents a day to remain in effect while silver is at fifty-five cents or higher and lead at $5.50 or higher.

The principal Tintic companies joining in the raise are Eagle & Blue Bell, Gemini, Ridge & Valley, Chief Consolidated, Iron Blossom, Grand Central, Lower Mammoth, Uncle Sam, May Day, Mammoth, Yankee, Colorado, Beck Tunnel, Dragon, Bullion Beck, Eureka Hill, Gold Chain, Opohongo.

The Park City properties affected are Daly-Judge, Silver King Coalition, Silver King Consolidated, Daly-West, Ontario.

It is estimated that the new scale adds more than $500,000 to the annual payroll of the three camps.

NEW ALUMNITE PLANT

Following the success of the potash plant erected by the Mineral Products corporation at Maryvale, Utah, the Frank R. Taylor company, of Philadelphia, through its representative, F. B. McCarthy, has announced at Salt Lake that it will build a plant, to cost $250,000, within three miles of Marysvale. It proposes to mine the alunite through shafts.

VAN LAW SUCCEEDS CARPENTER

C. W. Van Law, of Boston, second vice-president of the United States Smelting, Refining & Mining Company, has been elected president of the United States Fuel Company, succeeding E. L. Carpenter, of Salt Lake, who resigned recently.

A. B. Apperson, of Salt Lake, formerly superintendent of the Utah lines of the Denver & Rio Grande railway, has been elected general manager of the U. S. Fuel and has assumed charge of the company's extensive coal interests in Utah. He and Mr. Van Law went over the properties together recently and have decided on preliminary plans for improvements that will increase materially the output of the company's mines, the principal ones of which are at Hiawatha, Mohrland and Blackhawk, Utah. Increased electrical equipment is one of the improvement features to be taken up at once.

Mr. Apperson, the new local executive of the company, began railroad work in the West more than twenty years ago. He is not new to the coal mining industry, as he had charge of the railroad properties of the Consolidated Fuel Company for a little more than two years, leaving that service to join the Denver & Rio Rio Grande in 1909.

Mr. Carpenter was the object of much complimentary attention prior to his departure late in January for an extended pleasure trip to South America. He received a diamond ring from the employes of the U. S. Fuel Company, a silver loving cup from the Bonneville club of Salt Lake and was guest of honor at a special meeting of the Salt Lake Rotary Club.

Mr. Carpenter has been elected Vice-President of the Chesapeake & Ohio Coal and Coke Company, with headquarters at 120 Broadway, New York, and has already assumed his new duties.

WANTS ALL MINES INSPECTED

Legislation making approved safety-first methods mandatory for all mining properties employing more than twenty-five men is recommended by J. E. Pettit, state coal mine inspector, in his annual report just filed with Gov. William Spry, of Utah. He suggests inspection of metal mines as well as coal mines, the State having at present no provision for metal mine inspection, and recommends a single commission, with one deputy for coal mine and one for metal mines.

After pointing out that most of the large mines of the State already have first-aid instruction and mine rescue teams and equipment, he recommends that these features be required by law at all mines employing more than twenty-five men and that the use of electricity in mines be regulated by law.

Mr. Pettit recommended that a commission be appointed to formulate his suggested code, but the governor, finding that he had no legal authority to appoint a commission for this purpose, has directed Mr. Pettit to embody in a report of his own the ideas he suggested be considered by a commission.

BRAFFET HONORED

M. P. Braffet, one of the best-known mining attorneys and operators of Utah, was elected president of the Salt Lake Mining & Stock Exchange, succeeding R. J. Evans, at the recent annual meeting of the Exchange. Mr. Braffet has been an officer of the Utah Fuel Company for many years and is extensively interested in metal mines in various Utah camps. He is a director and a member of the Executive committee of the Utah Chapter of the American Mining Congress.

SYSTEMATIC EXPLORATION OF SUB-STRATA NEEDED

Need for a more thorough knowledge of the strata lying below the surface throughout the United States is becoming accentuated with each passing year. Many suggestions have been made for some systematic drilling throughout the entire country, and the matter again is being considered by several of the government's experts.

The most desirable way, of course, is to have the federal government undertake the sinking of drill holes wherever the stratigraphy of the country is not known.

While the Geological Survey and the Bureau of Mines are very much in favor of having the work done by the federal government, so as to supply them with data which is greatly needed, it is quite certain that Congress would not look with favor upon the federal government undertaking such work.

The next possible course would be the undertaking of systematic drilling by the individual states. In several instances states have undertaken this class of work in limited areas with good results.

For many years the U. S. Geological Survey has made every effort to secure the logs of wells drilled in different parts of the United States where the sub-strata were not already known. The difficulty, however, of securing cooperation from private drillers can be well understood since considerable trouble and expense are necessary in order to keep an absolutely correct log.

In metal mining regions of the West development work has been done almost exclusively on out-croppings of mineral veins. Since only a small percentage of the veins reach the surface the economic value of systematic drilling can be well imagined.

At Bay City, Mich., a hole was drilled to a depth of 3,500 feet in the hope of discovering an underlying bed of rock salt. Ten thousand dollars were spent in the effort and no rock salt was found. Since that time it has been demonstrated clearly that the $10,000 were very well spent because of the geological information which was made available, to say nothing of the money that otherwise would have been spent in useless drilling in an effort to locate salt beds.

In the oil regions much very valuable geological information has been furnished by the logs of the oil wells. In fact it is this very valuable information which proves beyond all question that a general drilling of the country would be an advisable undertaking.

One of the most important results in some portions of the country would be the mapping of the underground water supply. The government has done some drilling on public lands and upon Indian lands with the idea of developing water, and some work upon a small scale has been done in the search for potash and phosphate.

MOLYBDENUM DEPOSITS ARE DISTRIBUTED WIDELY

Molybdenum deposits are found in almost every large area of granitic rocks, though most of the deposits are small, frequently only a few flakes at a place. The largest known deposits in this country appear to be in Colorado, Montana, Idaho, Washington, and Maine. In Colorado a deposit has been worked near Empire by the Primos Chemical Company, of Primos, Pennsylvania. A deposit at Climax, Summit County, is being worked and the ores are milled by the Pingree Mines and Ore Reduction Company of Leadville, Colorado.

Methods of mining vary with the deposit. Where the deposit occurs as at Aurelia, Washington, in comparatively large lumps of molybdenite the ore is hand picked and cobbed. Where it is distributed through the rock in fine scales then it must be separated either by oil or water flotation or some similar process. Roughly, the metal is separated by reducing the molybdenite, in which form molybdenum is usually found, to ammonium molybdate or to the oxide, and this is then reduced either by heating with carbon or by heating with a reducing gas.

The market value of molybdenite is a matter of bargain between the producer and the purchaser. There is no established market price. The price may range from twenty cents to $2 a pound, depending on the ore, the place, and the needs of buyer and seller.

The cost of mining varies so much with conditions that no estimate can be made without knowing the circumstances.

Wulfenite, the lead molybdenite, is also used as an ore of molybdenum. Deposits are mined in the Caballoe Mountains near Engle, New Mexico, at Mammoth, Yuma, and other places in Arizona.

PREPARE PRELIMINARY BIG HORN BASIS REPORT

A preliminary report on the anticlines of the Big Horn Basin is nearing completion in the hands of D. F. Hewitt and C. T. Lupton of the United States Geological Survey.

This report will describe forty anticlines, of which eight have already been shown to contain oil and gas. The report will sum up three years' field work.

INCREASING CONSUMPTION OF GASOLINE CHIEF REASON FOR PRICE ADVANCE

Government Furnishes Congress with Concrete Information with Regard to the Sources of Supply, Methods of Refining, and Facts Concerning Petroleum Production—Oil Shales of West May Be Utilized Sooner Than Expected Heretofore

The Secretary of the Interior has submitted to the Senate a valuable compilation of information concerning gasoline. The conclusions drawn from this report are as follows:

The consumption of gasoline is rapidly increasing.

The production of crude has been generally regarded as near its maximum.

Some immediate relief may be afforded by means of the following:

(*a*) The use in internal combustion engines of heavier distillates approaching kerosene.

(*b*) An acceptable kerosene carburetor would at once go a long way toward relieving the present shortage of gasoline.

(*c*) General use of cracking processes whereby gasoline is made from kerosene and other less valuable petroleum oils. Such cracking processes are being rapidly developed and promise near relief. It is practicable to produce gasoline from kerosene, gas oil, fuel oil, residuums, and heavy crudes by present-day cracking processes, and no oil should be used for fuel that has not been so treated.

(*d*) Increasing the production of crude to furnish the necessary supplies of gasoline, but this is not to be recommended if it increases the output of distillates for which there is no market.

Looking to the future, benzol may be considered as a substitute for gasoline, and oil-shale as a substitute source of gasoline.

Benzol, a hydrocarbon not greatly different from gasoline, is recovered as a by-product in the manufacture of coke. At present benzol is not likely to find favor with automobile owners in the United States as a substitute for gasoline, although in general use in Europe. The objections made to it as a motor fuel are that it requires adjustments in the motor, and that the quantity of it available will be so limited as to preclude widespread distribution and ready availability at every cross-roads corner, which the gasoline user has come to expect.

The quantity of benzol produced in by-product coke ovens in the United States in 1915 was approximately 14,000,000 gallons, and at the present rate of production, and taking into account new plants under construction, the output in 1916 will be at least 22,000,000 gallons, or about 500,000 barrels. This quantity will be consumed in the manufacture of explosives, dyes, and chemicals such as carbolic acid, a type of demand, however, that is expected to be much smaller following the termination of the European war, which has resulted in the present high prices. Under normal conditions the price has been 20 cents or less a gallon.

The quantity of coal now made into coke is 60,000,000 to 70,000,000 tons annually and as under present practice the yield of benzol is 2 gallons from the ton of coal, the universal use of by-product ovens would increase the present production of benzol to over 3,000,000 barrels. The coal reserves available for the future production of benzol are enormous, but production of benzol as a substitute for gasoline cannot be expected to draw on these reserves faster than the demand for coke and for by-products other than benzol justifies the coking or distillation of coal.

The oil shales in Colorado and Utah constitute an undeveloped reserve of petroleum, to which attention was directed by the Geological Survey in 1901. Field investigations of these deposits are being carried on by the Survey to ascertain the distribution, richness, and quantity of these shales, and tests made by the Bureau of Mines to determine the most efficient methods of their utilization.

These oil-producing shales in northwestern Colorado have been examined with sufficient detail to warrant the estimate that there are thirty-nine townships (1,400 square miles) underlain by an average thickness of 53 feet of shale in beds 3 feet or more in thickness, which, according to field tests, will on distillation yield an average of 25 gallons of crude oil per ton of shale. The crude oil thus obtained will give under ordinary refining practice approximately 9½ per cent gasoline, and doubtless much larger amounts by modern cracking processes. There is in northeastern Utah an oil-shale area approximately equal to that in Colorado, and it is estimated that the shale in this State will have equal thickness and quality, thus doubling the total possible yield. Oil shale beds generally thinner or less rich are present also in southwestern Wyoming, and similar shales are known in the Eastern States.

The net result of the examinations already made is that these oil-shale areas in Colorado and Utah constitute a latent petroleum reserve, whose possible yield is several times the total remaining supply of petroleum. The gasoline content of the petroleum that can be distilled from these shales can be conservatively stated in billions of barrels.

The development of this enormous reserve simply awaits the time when the price of gasoline or the demand for other distillation products warrants the utilization of this substitute source. This may happen in the near future. At all events these shales are likely to be drawn upon long before the exhaustion of the petroleum fields. Shales of no greater oil content have long been mined and distilled in Scotland.

FLOTATION PROCESS NOW USED AT IMPORTANT UTAH MINES

The most notable improvement in the milling processes of the large copper mining companies in New Mexico and Arizona is the adoption of flotation, according to Professor Robert S. Lewis of the State School of Mines of the University of Utah. Professor Lewis, working in coöperation with the Salt Lake City station of the United States Bureau of Mines, recently made an extended trip to copper properties in those states:

Professor Lewis reports that owing to the high price of copper the companies are operating at full capacity. Nearly all the mines have a sliding wage scale, that varies with the market price of copper, consequently the miners are receiving maximum pay, and what might almost be called a boom spirit pervades the camps.

Many minor changes have been introduced in the milling methods, but the most notable improvement is the adoption of "flotation" treatment, either in whole or in part, by all the companies. With one exception, the mills have been in operation for several years, and flotation treatment has been added, but as an extension to former methods of concentrating the ores, it not being considered expedient to reconstruct the entire mill until the possibilities of flotation were more fully determined.

The weakness of the present systems of gravity concentration lies in the inability of the machines employed to make a high saving on the finest part of the ore, commonly known as slimes. The very finely divided mineral floats off on the water and cannot be saved by methods utilizing the difference in specific gravity between the valuable mineral and the waste or gangue as a method of separation. When treating an ore by flotation process, the valuable mineral is caused to float on the top of the water in the machines as a froth that is removed and the mineral recovered. The gangue or waste sinks to the bottom of the machines from where it is sent to waste. Generally speaking, the finer the ore is ground the more suitable it becomes for flotation treatment. It is evident that this method is a valuable aid to gravity concentration.

In what might be called the present combination treatment, the coarser mineral is removed by gravity concentration, and the fine mineral is recovered by flotation treatment.

The mill of the Inspiration Consolidated Copper Co., at Miami, Ariz., is a notable exception in that only the flotation process is used. This company has over 100,000,000 tons of 2 per cent copper ore in its mine, making it one of the leading copper properties of the country. The treatment of the ore is quite simple. It is first crushed to small size, then ground to the required fineness and sent to the flotation machines, which give a "concentrate," containing nearly all the valuable mineral in the ore, and a waste product or "tailing" that is thrown away. The concentrate is smelted and the copper content covered in the metallic state.

Conservationists may decry the fact that only from 60 to 65 per cent of the copper in the ores is recovered by ordinary milling methods, but it should be remembered that companies must be financially profitable in order to continue operations. A higher percentage of recovery is possible, but not profitable, due to the large increase in the size and cost of plant that would be required to obtain a higher extraction, and the comparatively small added saving effected.

The addition of the flotation process to gravity concentration plants has resulted in a profitable increase in the percentage of extraction, sometimes as great as 10 per cent. Since each additional saving of one per cent means an increase in output of 12,000 pounds of copper per day—considering the production of four of the largest companies alone—the economic saving to the country is seen to be of great value.

WANTS GOVERNMENT TO DO PROSPECTING FOR TIN

That the United States undertake certain tests of tin deposits has been suggested by S. H. Chauvenet, who has been identified with tin mining in the Franklin Mountains in the El Paso area.

Since the Government has done prospecting for potash, and has conducted some exploration work for coal and phosphate, Mr. Chauvenet is of the opinion that it would be greatly to the benefit of the nation to undertake certain drilling to establish the extent of tin deposits.

The need for developing tin in quantity somewhat commensurate with the demand, is just as necessary, Mr. Chauvenet believes, as is the discovery of potash and phosphate in commercial quantities.

Mr. Chauvenet spent $50,000 exploring the Franklin tin deposits. He believes that he has opened a mine of real value, but he is not in a position to do extensive drilling, which would be necessary to establish absolutely the value of these deposits.

It is not his idea that government drilling be confined to any one area, but he urges it be undertaken in South Dakota and North Carolina, or any other place where sufficient development work has been done to demonstrate the presence of considerable bodies of tin.

At Tinton, S. Dak., there is a considerable quantity of tin ore in sight, said to average 1 per cent per ton. At King's Mountain and Lincolnton, N. C., it is agreed that considerable ore exists, which runs 1 per cent per ton or better.

In England mines are being operated at great depth with antiquated methods which contain less than 1 per cent of tin. The known deposits in the United States have the very material advantage of containing few detrimental minerals.

NATIONAL CONSERVATION CONGRESS TO TAKE UP VARIOUS MINING TOPICS

Elaborate Plans Being Made for Meeting in Washington May 2, 3 and 4—Preparedness to be Discussed from Standpoint of the Miner and Other Producers—Best Means of Mobilizing Resources to be Considered

Many questions of importance to mining will be discussed May 2, 3 and 4, upon the occasion of the meeting of the National Conservation Congress. The keynote of the meeting will be questions effecting national strength and efficiency.

It is the intention of the Conservation Congress to go into the subject of preparedness much nearer its source than the making of big ships or the creating of an army.

At the meeting of the executive committee of the Congress, which was held last month in Washington, it was pointed out that conservation means more than saving. Some define it as being the fullest possible development with the least possible wastage.

Prof. G. E. Condra, of the University of Nebraska, President of the Conservation Congress, has developed many original ideas for making the meeting here in May one of the most comprehensive that ever has been held. He made tentative arrangements, while here, with President Wilson and the Secretary of the Interior to address the Congress.

The United States has been divided into nine regions in which fundamental industries center. One speaker has been chosen from each of these regions. Each representative will point out how nearly their industries are prepared for any emergency, and what steps are being taken to reduce waste.

In an effort to ascertain just what features of procedure of other countries should be adopted in this country and just what practices in other countries it would be best to discard, this subject will be discussed by speakers selected from naturalized citizens of the principal countries with which the United States has important commercial relations.

Moving picture films are to be used frequently during the Congress in an effort to impress more clearly the vastness of the resources and industries of the United States.

The entire second day of the Congress is to be devoted to a discussion of the best methods to mobilize the resources of the United States.

An important part of the work at the convention is to be done by committees. For instance, the committee on iron, which is in charge of E. F. Burchard, of the U. S. Geological Survey, will compile data with regard to how much of this important metal can be made available in case of an emergency. The committee probably will point out the necessity of opening iron deposits in other sections of the country so that, in the event of a successful invasion of a portion of the United States, it would not be possible to cut off the available supply.

Another committee will have charge of mineral fuels. Experts on coal and petroleum will bring out from a new angle many interesting features in regard to these highly necessary articles.

Maps will be used extensively in calling attention to the mineral resources of the country. A string will connect a sample of iron ore, for instance, with the district in which the ore is produced. This plan will be followed with respect to many of the important minerals of the country.

The need of fortifying this country with a sufficient nitrate supply is to have an important place in the deliberation of the Congress. Water power also is to be considered from several angles which have not been discussed widely.

Preparedness with regard to education, vocational guidance, discipline and other related questions will be taken up. The waste in education is great, it is claimed, and certain experts, including the United States Commissioner of Education, will point out where this unnecessary inefficiency can be reduced to a minimum.

Chemical preparedness is one of the various other questions which is to receive very minute attention at the meeting.

URGE COOPERATION WITH THE BUREAU OF MINES

An indication of the friendly feeling of the United Mine Workers of America for the Bureau of Mines is indicated in a committee report at the recent annual convention of the organization.

The committee report was put to vote and was carried. It reads as follows:

"With regard to the Bureau of Mines the committee concurs in the advice that the membership everywhere participate in and aid the work of the bureau and approve the organization cooperating with others in the creation of a memorial to Dr. J. A. Holmes.

"We approve the passage of an act creating the Bureau of Mines into a Department of Mining, with the secretary thereof a member of the President's cabinet.

"Delegate Lord, District 12, spoke in support of the report of the committee and called attention to the great importance of the bureau to the mining industry.

"The question was discussed briefly by Delegate Kennedy, District 7, and President White.

"The motion to adopt the report of the committee was carried."

DR. PARSONS TALKS TO SCIENTISTS ON RADIUM

In an address before the Cosmos Club of Washington, Dr. Charles L. Parsons, chief of the division of mineral technology of the Bureau of Mines, reviewed the work that has been done by the Bureau in its radium work. In part he said:

"The work of the Bureau of Mines on radium began in the fall of 1912. A preliminary report published in the summer of 1913 outlined the conditions of mining and the wastes involved in the carnotite ore region of the West. As a result of this investigation, Dr. Howard A. Kelly of Baltimore and Dr. James Douglas of New York City were interested, and they incorporated the National Radium Institute. This institute leased certain carnotite claims in Long Park, Colo., with the right to extract 1,000 tons of carnotite ore therefrom. The National Radium Institute arranged with the Bureau of Mines for a cooperative investigation of the methods of extracting radium from this ore and the saving of the wastes by the concentration of the low-grade ore formerly thrown on the dump.

"Sufficient funds were furnished to be expended under the direction of the Director of the Bureau of Mines, and the first plant was built in the spring of 1914, beginning production on an experimental basis in June, 1914. The result of the preliminary investigation was so successful that the institute authorized the construction of a second and larger plant which began operations in February, 1915; the two plants have been run continuously since that time.

"The object of the investigation was to procure an adequate supply of radium for the treatment of cancer in the two hospitals connected with the Radium Institute and to develop methods of extraction whereby the miners might obtain a more adequate return for their ore, which, before this investigation began, had been sold largely to foreign manufacturers. Incidentally, methods have been developed for the preparation of sodium uranate, uranium oxide, and iron vanadate—by-products from the extraction of carnotite ore. Before the Bureau's operations began, several methods, the details of some of which have been kept secret, had been devised for the extraction of radium from pitchblende and from carnotite. These involved (1) the use of an acid leach; (2) the use of an alkaline leach followed by acid; (3) fusing the ore with some material that would make extraction of the valuable contents possible. The acid leaches had been extensively used abroad and had shown an extraction of not over 70 per cent and probably little over 50 per cent of the radium content, owing to the fact that the ores contain sulphates, and any radium sulphate present was not removed under these conditions. The alkaline leach followed by an acid leach would probably remove more radium but involves such grave difficulties of filtration that it seemingly has not been put into commercial use. Fusing the ore with sodium sulphate was long employed on pitchblende and has been used in Australia by Radcliffe in treating carnotite that is obtained at Olary, South Australia. This carnotite, being mixed with ilmenite, is very different from the American carnotite. Fusion with sodium carbonate has also been employed in this country on carnotite ores but has the great disadvantage that it carries a large part, if not all, of the silica into solution. This adds greatly to the cost of operation and tends to give radium-barium sulphates of a rather high degree of impurity which require special treatment. From the best accounts available, it appears that this method does not successfully extract more than 70 per cent of the radium present in the ore.

METHOD OF ORE TREATMENT

"The method devised by the Bureau of Mines is based upon the fact that strong, hot nitric or sulphuric acid dissolves radium-barium sulphates in considerable quantities, as well as the other soluble constituents of the ore. Hence the radium-barium sulphate left behind when dilute acids are used for leaching is obtained in solution and recovered. The use of strong, hot nitric acid, although it presented many difficult problems of chemical engineering, was chosen because the radium-barium sulphate could be precipitated at once in a remarkably pure form and the nitric acid could be largely recovered in the form of sodium nitrate and used again. Accordingly a nitric acid plant was built in connection with the radium plant and has been regularly operating since February, 1915.

"In the Bureau of Mines method, the ore, pulverized to 20 mesh, is fed into an earthenware boiling kettle containing 38 per cent nitric acid. The nitric acid is brought nearly to boiling by means of steam passed through a glass tube. When the boiling point has been nearly reached the ore is added a shoveful at a time and the whole stirred, heating being continued. After the ore has all been added, heating is continued for fifteen minutes when the mass is run on to an earthenware filter and the nitric acid separated from the ore by suction. The ore is re-treated with hot nitric acid of one-third the original strength, and is then washed with hot water. This treatment brings into solution nearly all of the uranium, about 50 per cent of the vanadium, and practically all of the radium present in the carnotite. The residue is discarded. The filtered solution is stirred, and sodium hydroxide is run in slowly with the object of reaching as nearly as possible the neutral point without forming a precipitate. If too much sodium hydroxide is added, both iron and vanadium are precipitated, discoloring the radium-barium sulphate. On the other hand, if not enough sodium hydroxide is added, the acid remains too strong and the solvent action of the nitric acid on the radium-barium sulphate is not sufficiently decreased. By a little practice the right point is easily obtained. Barium chloride is then added in the proportion of 2 pounds of $BaCl_2$ to 1 ton of ore and is thoroughly stirred in, and 15 pounds of sulphuric acid to 1 ton of ore are then added. As the ore contains some barium it is necessary to add only a comparatively small amount of this material to accumulate the radium. The whole mass is vigorously stirred for one hour; the solution is then elevated to conical tanks where it is allowed to settle, usually for three to four days. The supernatant liquid is siphoned off for the recovery of uranium and vanadium and the radium-barium sulphates are collected on an earthenware filter, washed, treated with dilute sodium hydroxide, and dried."

Continuing, Dr. Parsons told of the refining; separation and purification of uranium; recovery of vanadium; nitrate recovery; recovery averages and gave cost data.

SENATOR WADSWORTH SOUNDS WARNING AGAINST STRIKE

Washington *Post.*

Directing attention in a recent address to the pending demand of railway conductors, trainmen, engineers and firemen all over the country for an eight-hour day and pay and a half for overtime, Senator Wadsworth, of New York, sounded a warning against any strike ultimatum. It has been suggested that the railroad employes early in March would not only submit their demands for a $100,000,000 increase in wages under the name of an eight-hour law, but would couple it with an announcement that any offer of arbitration would be rejected.

It would be deplorable if the railroad employes should adopt such a course. Even the employes themselves will recognize the merit of Senator Wadsworth's friendly warning:

"I say to you in all solemnity that, big as you are, powerful as you are, determined as you are, your cause will be lost in the very statement of it if arbitration is refused, and I say this with no possible disparagement of the merits or justice of your demands. Whether you will strike or not is up to you. But if you couple with it the declaration that the claims of the railroad companies are not even justifiable and that all offers to that end will be rejected by you, then I tell you you must arbitrate or take the consequences."

Senator Wadsworth pointed out that every railroad is a post and military road of the Government, made such by act of Congress, and that government itself is but the executive of the public will. If the employes should make demands upon the railroads which are refused for reasons good, bad or indifferent, it is scarcely possible that the public will pause in its innumerable activities to wait with folded hands the outcome of the contest. The Government itself would be compelled to break such a strike even by running the railroad itself and then forcing arbitration.

It had been understood for nearly a month that the railroad employes would definitely include a refusal to arbitrate in their new wage demands. The demands will be made early in March, but it is inconceivable that the employes would decide the case against themselves by rejecting arbitration in advance. That is what a refusal to arbitrate would mean. Senator Wadsworth, in Washington as at Albany, has been a friend to labor. The warning he has issued is a warning by a friend to those whose welfare he seeks to conserve. There is little doubt that his words will have weight with the great organizations which are now formulating their demands.

COAL WAGE SCALE CONFERENCE

Each Side Hopes for an Early Adjustment

The committee having in charge the adjustment of the bituminous wage scale for the States of Illinois, Indiana, Ohio, and Pennsylvania, began their adjourned meeting at McAlpin Hotel in New York City on February 24. At the first meeting in Mobile, Ala., substantial progress was made, but no conclusion was reached. The question of an advance in scale was temporarily disregarded and the question of what should be the basis of a mine run rate for Ohio, Indiana, and Pennsylvania, was first under consideration. The operators insist that if a mine run basis is accepted that the rate should be 44.61 cents for machine mined coal, mine run in Ohio and Pennsylvania, while the miners insist that it should be 47 cents. The Indiana operators claim that if a mine run basis is accepted, that it should be on the basis of the Danville agreement, 61 cents for pick mining, and insist on existing machine differentials of 10 cents for punching machines and 12.5 cents for chain machines. The miners concede the 10 cent differential for punching machines, but insist on a 10 cent differential for chain machines also. Both sides stand firm for their respective demands, but a feeling exists that an agreement will be reached. Operators representing the respective States were in attendance as follows: *Illinois*, C. M. Moderwell, E. T. Bent, A. J. Mooreshead, S. A. Shafer, James Needham, James Forester, W. B. Joss, Rice Miller, W. L. Schmick, W. J. Spencer, J. W. Gilchrist, L. H. Smith, E. C. Searles, Thomas S. Brewster, Herman Perry, P. J. Wilson, H. E. Bell, Carl Scholz and C. E. McLaughlin; *Indiana*, J. K. Dering, J. C. Kolsem, Philip Penna, A. M'Ogle, M. L. Gould, David Ingle, W. J. Freeman and Homer Tally; *Ohio*, C. E. Maurer, Michael Gallagher, W. H. Haskins, John H. Winder and G. C. Weitzell; *Pennsylvania*, W. K. Field, W. W. Kiefer, George Schluederberg, John A. Donaldson and John H. Jones.

Thursday, March 2, has been fixed as the date of conference between the anthracite operators and the miners.

ENCOURAGED BY DISCOVERY OF PLATINUM IN SPAIN

Great interest has been manifest at the United States Geological Survey in the reported discovery of platinum in Spain. The announcement simply tells of the certainty of the presence of platinum in characteristic formation in the Ronda hills in the Province of Malaga and mentions no extensive prospecting.

If platinum can be developed in commercial quantities in Spain it will be welcomed by users of platinum in this country, where the demand is constantly increasing. As has been stated frequently, the chances for developing platinum in any large quantity in this country are practically nil.

STEP IS TAKEN TOWARD MINERAL INDEPENDENCE

As the result of investigations conducted by the Bureau of Mines the United States within a very few weeks will be entirely independent of other countries in regard to kaoline.

This achievement of the Bureau of Mines is regarded here as an indication of the importance of the work of this bureau in making the United States independent of foreign mineral supplies. While the results will not be as far reaching as the Rittman discoveries of oil refining processes or the accomplishments of the Bureau in reducing the number of explosions and deaths in mines, yet disinterested experts hold that in principal the kaoline achievement must be given rank with the other notable accomplishments of the Bureau.

The division of mining technology, under the direction of Dr. C. A. Parsons, has been experimenting for two and one-half years in an effort to purify the secondary kaoline which occurs in extensive deposits in Georgia.

The actual work has been in charge of Ira E. Sproat. It is possible to produce a kaoline which equals the best of the imported product, and within a short time it will be possible to supply from American deposits sufficient kaoline to meet the entire demands of the United States.

ARKANSAS "LAKES" PROBABLY NEVER CONTAINED WATER

The U. S. Geological Survey just has completed an investigation of Tryanza and Hickory Lakes in northeast Arkansas. These so-called lakes are not lakes at the present time, but it is claimed they were lakes at a previous time.

If it can be shown that they were lakes and have since become land, the area belongs to the riparian claimants. If the old survey proves to be in error or is fraudulent, the land belongs to the government and is open to homesteading. An examination of other lakes in the same part of the State developed good geological evidence that there were no lakes there in 1840.

Each existing map, even to this day, gives these lakes as water, despite the fact that it is practically certain that water never existed there. It is possible that the original surveyors did work in the region during the time of the overflow, and marked the lakes in error.

No Demand for Tantalum

Tungsten has replaced tantalum in the making of incandescent electric lamp filaments, and there seems to be no other use for tantalum which is sufficient to create a market for the ores.

GEOLOGICAL SURVEY MAY BE GIVEN ADDITIONAL FUNDS

Appropriations of $160,000 additional have been requested this year by the U. S. Geological Survey, and the matter is now before Congress in the Sundry Civil Bill.

One hundred thousand dollars of this amount is for the development of water resources in some of the desert valleys of the West. It is proposed to conduct boring operations with an idea to discovering water bearing strata which will make irrigation possible.

Fifty thousand dollars of the additional amount requested is for geologic work. This simply replaces the item cut from the appropriation for 1915, due to the general effort at that time to reduce government expenditures.

The additional $10,000 is for printing maps. This is made necessary by the increased demands for topographic maps published by the Survey.

CHANCE FOR BIG PROFIT OFFERED AMERICAN MINER

Some American miner has an opportunity to make a splendid profit if he can produce metallic arsenic within the next few months.

Previous to the war all metallic arsenic consumed in this country came from Germany. The consumption of this product in the United States is not great, as the imports before the war averaged only 8 tons monthly. Since the war, for some inexplicable reason, the demand has grown so that 25 tons per month are being consumed.

The visible supply is about exhausted, and there seems to be little opportunity of replenishing it until the German ports are open.

Frank L. Hess, the United States Geological Survey specialist on rare metals, has the following to say in regard to arsenic production during 1915:

"The year 1915 saw another increase in the output of white arsenic, and the estimated production for the twelve months is reported by the United States Geological Survey to have been 5,195 tons (of 2,000 pounds) with a value at the smelters of 2 cents a pound or a total of $207,780. The estimate by Frank L. Hess is based on the known production for the first ten months of the year and the probable output during November and December. This output is an increase of more than 11 per cent over the 1914 production and 65 per cent over the 1913 output.

"All white arsenic made in this country is a by-product in the smelting or refining of the non-ferrous metals, and naturally the larger part is saved at the western plants. The demand is far below the possible production, which could probably be made treble or quadruple the present output if prices were sufficiently encouraging.

"The largest uses for arsenic are in the manufacture of insecticides, such as Paris green, lead arsenate, etc.; in glass making; and as a weed killer. Small quantities are used in shot, medicine and dyes.

NEW HOME OF THE INTERIOR DEPARTMENT AS IT APPEARS TODAY

The Bureau of Mines, Geological Survey, Land Office and the Reclamation Service are among the Bureaus Which Will Occupy the Edifice

MINING ON BOOM IN TENNESSEE AND VIRGINIA

Mining in Tennessee and Virginia is picking up with a rapidity which is attracting attention. The price of zinc and the increasing demand for iron pyrites is becoming very much greater. A number of properties that have been idle have been started and numerous prospects are being opened.

The demand for pyrites comes largely from sulphuric acid manufactures. The war has so increased the demand for this acid that it is with difficulty that the demand is being supplied. Increasing ocean freight rates are militating more and more against the use of Spanish pyrites.

OTHER ORGANIZATIONS JOIN HOLMES' MEMORIAL ASSOCIATION

Additional societies have affiliated themselves with the Joseph A. Holmes Memorial Association during the past month, as follows: Western Federation of Miners; Society for Testing Materials; Society for the Promotion of Engineering Education and the Mining Ins. Institute of the United States.

An important meeting of the association will be held March 4.

MANY PLACES TO INVESTIGATE POSSIBILITIES OF GAS OCCURRENCE

Since the examination of the area around Dallas and Fort Worth, Texas, by the U. S. Geological Survey engineers to determine certain facts in regard to the presence of gas and the probable available supply, numerous requests have come requesting information as to conditions under which similar examinations will be made. Wherever possible the Survey will undertake cooperative work of this nature.

While these examinations are made of comparatively large areas in a very limited time, good results, as it gives an idea of the possibilities of exploration work there and also determines very definitely the present gas supply and its probable duration.

In the Dallas and Fort Worth area it was determined that there was no place where there is reason to suppose there is no gas.

The State of Mississippi now has under consideration a bill appropriating $10,000 for cooperative work with the idea of determining the most likely places in the State for the occurrence of oil and gas.

Will Exhibit at Centennial

The U. S. Geological Survey will contribute an exhibit to the Mississippi State Centennial which is to be held at Gulfport next year.

Alaska to Uncle Sam

While all Europe is a shamble,
  And the whole world is at war,
And half the land the sun shines on
  Is drenched in human gore;
When every nation counts the men
  It knows are tried and true,
We send this message to you, Sam,
  "Alaska stands with you."
You never treated us quite right,
  You grabbed away our coal
And then reserved our firewood
  And what we've used we've stole.
You soaked us on our cable tolls,
  But we don't give a damn;
At twenty-eight cents per word, we say,
  We're with you, Uncle Sam.

You've squandered untold millions
  On the lousy Philippines;
But you always made Alaskans
  Go and rustle for their beans.
Your black and tan possessions,
  While they've cost you quite a few,
Can never be depended on,
  But—we'd go to hell for you.
We're quite unused to luxuries,
  We've always played alone;
When we asked for help to build our trails
  You handed us a stone.
You four-flushed on the railroads,
  But we don't care a damn,
If they monkey with the Eagle,
  We're with you, Uncle Sam.

You gave us leave to make some laws
  Then tied our hands behind.
This gift to us was just the same
  As pictures to the blind.
Your laws all have a "joker,"
  Made to catch some sour dough,
And its hard to beat your game, Sam,
  The way it's framed up, down below.
We've always been the dumping ground
  For your political misfits;
But Sam, if you're in trouble
  We're willing to cry "quits."
We've never had an even break.
  But we don't care a damn,
If the Lion growls, remember this,
  We're with you, Uncle Sam.

We're used to meeting troubles,
  And if you put us to the test
You'll find Alaska loves you, Sam,
  Far better than the rest.
But Sam, when this is over,
  As morning follows night,
Pray give us some attention
  And set some matters right.
We need some decent cable tolls,
  We need some decent mails,
We need some decent coast lights,
  And we need some decent trails.
You've given these to all the rest,
  But we don't care a damn,
If it's full grown men you're needing,
  We're with you, Uncle Sam.

Pat O'Coller.

Seward, Alaska.

CALIFORNIA SHIPS INCREASING AMOUNT OF CHROMITE EAST

Owing to the great demand for chromite brought about by conditions in Europe, the production for 1915 was much larger than any previous year. The imports upon which this country has relied so largely practically were cut off. This resulted in increased prices, which greatly stimulated the home production. California is the banner state in the production of chromite, and large quantities have been shipped to the eastern markets during the past year.

MUCH WASTE IN TREATING U. S. ANTIMONY ORES

As ordinarily practised in this country the treatment of antimony ore simply means hand picking so as to get rid of most of the waste and the richer ore only is shipped. At one place in Montana and near Kellogg, Idaho, oxide plants were at one time worked. In these plants the antimony ore is roasted under oxidizing conditions and the white oxide of antimony is volatilized, collected in chambers, and shipped. The oxide is used either as a pigment for paints or is smelted for the metal.

At two or three places in Nevada and California the ore has been "cruded," that is, the ore has been heated in crucibles and the native antimony sulphide, stibnite, which melts at a comparatively low temperature, has been allowed to flow out, thus forming what is known as "crude" or "needle" antimony. The process is wasteful but ores can sometimes be treated in this way and shipped where high freight rates and the low grade of the original ores would otherwise proclude shipment.

Antimony ore is found near Gillham, Sevier County, Ark. The other principal producing States of the Union are Nevada, California, Idaho, Montana, Oregon, Washington and Alaska.

GERMANS HAVE NO SUCCESSFUL SUBSTITUTE FOR COPPER

Opinion in Washington regarding the future of copper varies widely. Some well qualified experts believe that at the end of the war, copper will drop very low in price, while others present very convincing arguments to the effect that there will be little depression in price after the war.

Not a great deal of stock is taken in the reports from German sources that Germany and Australia are replacing copper so successfully with other metals, which they will continue in use even when copper is available. It is stated that soft iron, aluminum and brass, are being used extensively for wires to carry electric current. It is believed here that these simply are makeshifts which are vastly inferior to copper.

Aluminum ores for instance are very scarce. They are scarce in Germany. No one has developed a process of securing aluminum in commercial quantities from clay. Even if aluminum could be produced as cheaply as copper, it is not as suitable for electric transmission as the cross sections of an aluminum wire would have to be very much larger than that of a copper wire of the same current capacity.

In many sections where there are sleet and snow the desirability of using wires of small cross-sections is well-known. On interurban trolley wires, for instance, aluminum wire of the size to carry a sufficient load of current would be much more likely to be dragged down by the sleet and ice. The inferiority of iron and brass is also very well understood.

GEOLOGIST DECLARES SLIDES ARE NO MENACE TO THE PANAMA CANAL

Bureau of Mines Bulletin Tells Why Earth Slips into Big Ditch—Faults Have Cost United States Many Millions of Dollars More than Original Estimates

Some engineering problems of the Panama Canal in their relation to geology and topography are discussed in Bulletin 86 of the United States Bureau of Mines, just issued, Donald F. McDonald, author. Mr. McDonald was detailed as geologist to the Panama Canal while it was under construction. The paper aims to discuss from the viewpoint of the mining geologist the bearing of topographic and geologic conditions on certain problems that arose in the construction of the canal.

"The bulletin is published by the Bureau of Mines," says Mr. McDonald, "as a contribution to engineering literature, because it presents information that shows how geology and topography must be considered by the mining engineer in planning excavations and in removing loose material and solid rock in the safest and most efficient manner."

UPLIFT IS SLOW

As to estimate of the stability of the Isthmus of Panama, Mr. McDonald says, "In all, there is a clear record of four oscillations and the beginning of another elevation. Hence the question, Is the canal in danger from this uprise? Should the emergence be rapid of course it would be in some danger; but the fact is that the average rate of uplift for, say, the last 1,000 years has been something less than 0.03 foot a year (or less than 3 feet in 100 years.

"It is believed that the sinking of the ocean bottom outside the relatively shallow depths of the isthmian shore waters has been the chief cause of the earthquake periods that have, so far as the records go, visited the isthmus every thirty to thirty-five years and that each of these seismic disturbances has resulted in some increased uprise of the land mass.

"From the various oscillations of the land above and below sea level, as already noted, one would expect that the rocks constituting the isthmian land mass would have become broken and dislocated in these upward and downward movements, and this has happened. Great fracture planes cut the rocks and trend mostly northeast-southwest, or approximately parallel with the axis of the land mass, with some minor fractures leading in other directions. Along these fracture planes differential movements, some of which measure hundreds of feet, have taken place. The frictional drag of these movements has crushed and broken the softer rocks for several feet on each side of the plane of motion.

INCREASED CANAL'S COST

"This faulting has had a most important bearing on engineering, because the faulted zones, especially where the rocks are extensively crushed and broken, have tended to promote slides. At any rate, so far as the digging of Culebra Cut is concerned, these faults have increased the cost of the canal several millions of dollars."

Mr. McDonald takes up quite fully the question of slides and especially those in the Culebra Cut. As to the slides, Mr. McDonald says: "Culebra Cut is a vast ditch that passes through many varieties of rock in the 9 miles of its length. Some of these are weak and unstable, and where the slopes of the cut were steep and 100 to 300 feet high the weaker rocks locally crushed down to flatter slopes. The flatness depended on the material involved, but, whatever the material, whenever the slope got flat enough the sliding stopped. At no time did the engineering staff constructing the canal believe that the slides were a menace to the ultimate completion and successful operation of the canal, in spite of the fact that at times they were somewhat troublesome. They have made necessary the excavation of about 30,000,000 cubic yards more than was included in the first estimates for Culebra Cut, but they have not in the past and will not in the future endanger the ultimate success of the canal.

CRACKS DEVELOP

"The largest and most important slides developed from structural breaks and deformations. Fortunately, they occurred only near Culebra in a section of the cut not much over a mile long. These deformations first manifested themselves by the appearance of one or of a set of cracks or fissures parallel or somewhat oblique to the edge of the cut, and from a few yards to some hundreds of yards back from it and from each other. Some of them were traceable on the surface for several hundred yards and gradually developed into perpendicular crevices up to one-third of a yard wide and many yards deep.

"The chief slides due to structural breaks have taken place in that part of Culebra Cut lying between Gold Hill and Empire Bridge. On the west side in this section of the cut sliding began in October, 1907, and extended so that in all over 70 acres of material moved or was seriously cracked. This movement necessitated the removal of over 11,000,000 cubic yards more than was comprised in the first estimates. This amount, of course, included the material removed from the upper part of the slopes in order to make them less steep and more stable. Sliding began on the east side of this section of the cut about January, 1907. In all some 55 acres of land surface has been in motion here since then, adding close to 8,000,000 cubic yards to the first estimates. The relieving process on this part of Culebra Cut was in 1914 not yet quite complete, and a considerable amount still remains to be moved before perfect stability of slopes will prevail.

"The structural-break type of slide is therefore responsible for the movement of about 19,000,000 cubic yards of material over and above that included in the first estimates.

SLOPES WERE TOO STEEP

"In summary, then, the structural-break type of slide was due to oversteep slopes in places where the banks were high and the rocks weak. The remedy was to unload the unbalanced pressure and to reduce the slopes. The ends sought to be accomplished by the remedy were a reduction of the amount of excavation that otherwise would be necessary and non-interference with tracks, drainage, etc. The slopes stood at a much steeper angle before being disturbed than after they had been weakened by deformation.

"Though it is not impossible that a destructive earthquake might visit the canal, still it is extremely improbable. In summary, then, the following are the chief reasons why it is believed the canal will never be in any appreciable danger from earthquakes.

"The larger number of tremors detected every month by the recording instruments is evidence that slow adjustments are constantly taking place and thus that no great accumulations of stress that might later culminate in a big shock are probable.

"The absence from the isthmus region of high mountains and of geologically recent volcanic activity is evidence in favor of the probable absence of earthquakes, especially as such high mountains are a striking geologic feature of the whole Central American earthquake belt.

"The presence of numerous small faults and of the faulted conditions of such volcanic cores as Gold Hill and Contractors Hill is evidence that adjustment here has progressed well on toward normal conditions of equilibrium

BIG QUAKE IMPROBABLE

"The tensile strength of the majority of the rocks within the Canal Zone is rather low, and they would shear with comparative ease, thus preventing any relatively great accumulation of stress that might result in a comparatively intense shock. However, experience teaches that where earthquakes happen the buildings suffering the maximum destructive effects are those built on loose and friable material. This consideration might therefore subtract a little from the saving benefits of the yielding and preventative qualities of the Canal Zone rocks.

"Over 300 years of earthquake observation shows only two shocks of considerable magnitude, and there is every reason to believe that the severest of these would not have seriously damaged even the most delicate parts of the canal.

"That many small and harmless shocks will traverse the Canal Zone is certain, but that the canal is in any real danger from earthquakes is contrary to all the evidence."

INCIDENT IN MINE EMPHASIZES NEED OF FIRST-AID TRAINING

While two fire runners were busy in No. 38 mine, Alderson, Okla., one of them, Ed. Gallimore, was overcome. His partner found him in a room unconscious, and immediately telephoned for the mine foreman, S. B. Reddell. Accompanied by the runner and one other man, Reddell went down the slope and into the room where Gallimore was lying. As the latter is a large man, weighing nearly 200 pounds, they had some trouble in handling him, but immediately applied artificial respiration, using the prone method. The patient's jaws were closed and set, so that it was difficult to pry them open.

The rescuers dragged Gallimore into the entry to a curtain where there was some fresh air, and laid him under this curtain while they continued to administer artificial respiration. After working about forty minutes, they got him out to the slope, and took him to the surface on the trip.

Doctors arrived shortly afterwards. By this time the patient was making an effort to breathe and was semi-conscious. The doctors directed that he be kept quiet, warm, and be given plenty of fresh air, and in an hour's time he began to struggle so violently that it was difficult to hold him.

The rescuers have been attending the first-aid classes recently organized at Alderson, and are members of the team recently organized from the No. 38 mine by J. W. Koster.

Superintendent P. W. Malloy stated that the prompt first-aid work rendered by these men undoubtedly saved Gallimore's life, and that the first-aid work had already shown its value to his company and to the employes.

STANFORD ALUMNI HONOR THEIR FORMER TEACHER

Dr. J. C. Branner, who resigned the presidency of Stanford University at the end of 1915 was in Washington at the beginning of February. Dr. Branner is a member of the Commission appointed to study the slides along the Panama Canal and on his way from Panama visited Jamaica. He was called to Washington to testify in the Congressional hearings on the California oil-lands.

Mrs. Branner accompanied Dr. Branner. A reception was given them by the Stanford Alumni of Washington at the home of Dr. and Mrs. George H. Ashley.

STOCKHOLDER SCORES OIL LEASING MANIPULATIONS

The following statement by Edward J. Holmes, of Boston, was made recently before the Senate Committee on Puelic Lands.

Mr. HOLMES. Mr. Chairman, I am a stockholder in the Boston-Pacific Oil Co. I have no authority to represent the company, or anybody but myself and a few stockholders, who feel as I do in regard to things. This company is a small one. Its claim is about 160 acres of land within the Maricopa district, Cal.

Senator Works. Has there been any disagreement among the stockholders about that, Mr. Holmes?

Mr. Holmes. Oh, no. I simply mean that those who live in Boston thought there ought to be some presentation of our case, and I said that I was willing to come here and present the case for them, and they said all right.

Our location was made on April 12, 1909, by bona fide locators, who immediately set to work and before President Taft's preliminary withdrawal order had built a substantial two-room house, dug a sump hole, and had lumber for a derrick hauled on to the land. One or two months before September 27, 1909, the date of the preliminary withdrawal order, they were compelled to stop work for lack of water and money. Water had to be pumped from a distance and required the installation of pumping machinery and pipes, involving so great an expense that it required a combination of several interests to finance it.

One locator lived in the house on the property continuously until after September 27, 1909, and I think until December 15, 1909, when all the locators sold their interests to J. M. McLeod, who then completed arrangements previously entered into for water, and started to develop the property. On March 15, 1910, we took a lease from McLeod, and were in diligent prosecution of the work before and at the time of the passage of the Pickett bill, June 25, 1910, and President Taft's second withdrawal order on July 2, 1910. We continued drilling diligently, and after spending all our money and going heavily into debt, and after various vicissitudes, we finally discovered the oil, at a depth of over half a mile below the surface, on June 8, 1912.

I wish to add that we are within the naval reserve, our property being on the extreme edge. We spent our money and discovered oil several months before we had any idea that our property was desired for the reserve. The well began to flow August 6, and was in good working order in November, 1912. As I understand it, no fault has been found with our work, but in the opinion of the Government authorities our predecessors in interest had not worked with sufficient continuity to entitle us to the relief given to some by the Pickett bill.

President Taft's executive order establishing the naval reserve was not issued until December 13, 1912, so that we had spent our money and discovered oil several months before we had any idea that our property was desired for the Navy. If our property were outside the naval reserve, we would be entitled to relief under the terms of H. R. 406. It seems to us that it is unfair that we should be deprived of this relief merely because our property happens to be just within the line of the territory covered by the naval-reserve order. When we were spending our money we could in no way have foreseen that such order would be issued, and that its issuance would mean that our property would be dealt with differently from neighboring property.

The Department of Justice has brought suit against us, has had a receiver appointed, and seeks to eject us from the property, to take the money in the bank, and to collect from the stockholders who have never received a dividend or a return of any kind from their investment, the value of all the oil heretofore produced.

Since April, 1914, some, and since February, 1915, all of the proceeds from the sales of our oil have been placed in escrow in banks of San Francisco to await a decision on our right to the property. There is now about $240,000 so placed.

Until we had invested upward of $50,000 we did not know of the first withdrawal order. When we were informed of it we believed, after such investigation as we could make, that the work done by our predecessors in interest would entitle the company to a patent, or at least a lease under what we supposed would be the proposed new legislation regarding public lands. The idea of a naval reserve had at that time never been even suggested, so far as we knew.

Senator Works. How much money had you expended, Mr. Holmes, before the naval-reserve order was made?

Mr. Holmes. All of it. After this time money began to come in.

Senator Works. Was that order made after you actually discovered oil?

Mr. Holmes. Oh, yes, sir; several months after. We discovered oil in June, and the well flowed at a very rapid rate, several thousand barrels a day, in August, and it was not until the following December that the naval reserve order was issued.

We were hard at work developing the property when the Pickett bill was passed, and when the naval reserve order was issued we had discovered oil and were producing from one well and drilling another. We did not dare to stop work at any time after we began lest we should be held to have abandoned the property and to have forfeited the right, which, until very recently, we believed we had, to a lease or a patent, and as a result we have felt it necessary to go ahead, and have done so at great expense. Now, because of the naval reserve order, which we could at no time have foreseen, it appears we are to be deprived of the relief which our neighbors, who have acted just as we have, and in no better faith than we have, are to be given.

There is another point which I want to mention, though not to unduly emphasize, because there is a decided difference of opinion on the subject—that is the distance which oil will flow underground. It is my firm belief that the naval reserve tract will, unless properly developed by or for the Navy Department, be drained practically dry by wells on patented lands within or adjoining it. My reason for being of this opinion is based on our experience.

The K. T. & O. Co. has a well 400 feet from one of ours. It sanded up last November, and as a result thereof the pressure in and production from our well immediately began to increase. In three days the pressure increased from 120 pounds to 170 pounds, and our production increased 75 barrels a day, about a 15 per cent increase in production.

Prior to the K. T. & O. Co.'s wells sanding up the pressure of and production from our well had varied very little.

There really is not anything more to say, so far as the facts are concerned. The wells have been producing and the money has been going into escrow, and we are hoping to receive a patent which we feel that we ought to be entitled to. If, on the other hand, it should appear to be impossible for a patent or patents to be granted to a company situated as ours is, then the first section of the proposed amendment—I do not know how it should be described—would cover our case.

The provision in the original bill, I think, also covers our case—I mean, in so far as any lease can cover it—but it leaves the matter discretionary with the Secretary of the Interior, and I fear that if the Navy Department shall decide to oppose the granting of any leases within the naval reserve the comity existing between the departments would make it difficult for the Secretary of the Interior to grant a lease to us, unless it were made very clear that it was the intention of Congress that, in meritorious cases, leases within the naval reserve should be granted.

I understand that the Navy Department will oppose the granting of leases, because when we applied for a temporary lease, under the provisions of Senate bill 5673, of the Sixty-third Congress, which left the matter to the discretion of the Secretary of the Interior, we were informed that the Navy Department did not desire the Secretary of the Interior to grant any leases in the naval reserve, and the Secretary of the Interior did not feel at liberty to grant them in the face of that objection.

BOULDER COUNTY, COLORADO, GREAT FERBERITE PRODUCER

The term ferberite applies to that tungsten mineral which is composed almost wholly of iron tungstate. Wolframite is the iron manganese tungstate, and hübnerite the manganese tungstate.

The occurrence of all three minerals in the United States is very similar, but they do not ordinarily occur together, although a part of the ores mined in the Boulder County district, Colorado, which is the great ferberite bearing region of the world approaches the composition of wolframite. There is, however, only a very small part of the Boulder County ores which should be called wolframite.

LARGE COMPANIES BEING ASSISTED BY METALLURGISTS

As an indication of how much the research work being conducted by the department of metallurgical research, of the University of Utah, in cooperation with the U. S Bureau of Mines, on flotation, cynidation, precipitation, treatment of zinc-lead complexes, oxidized zinc, lead leaching, and other problems of concern, is attracting attention of the mining industry, within the past few weeks, two of the largest mining and milling companies in Utah, and one in Idaho, have detailed technical men to work in the laboratories of the department. These men will avail themselves of the data which has been collected by the department as a result of its research work and which will assist them in the solution of the problems in which they are especially interested.

The addition of these three companies increases the number to eight who have representatives working on particular problems in the laboratories of the department at the present time. The number of mining companies and individuals who are availing themselves of the opportunities afforded by the department for carrying on work of this kind is a source of much satisfaction to those in charge of the work, as it demonstrates to them the value to the industries of the investigations in which they are at present engaged.

WINDSTORM PLAYS HAVOC IN THE PARADOX VALLEY

The camp at the mines in the Paradox Valley, Colo., where the Bureau of Mines is extracting radium ore, was damaged by a storm last month. In his report the superintendent said in part:

"A windstorm entirely demolished the warehouse, three of the seven bunk houses for the men, and the dining room. Only the floor of the warehouse remains; the canvas of the tents was ripped to shreds. The cook house was uninjured except for holes in the roof. Our own tent we saved by almost superhuman efforts. Allen placed heavy guy-lines of wire on the corners when the wind first began, the tent rocked so, and with every severe blast we threw our weight against the frame from the inside and kept it from caving in, though it rocked like a ship in a heavy sea. The sensation was not a pleasant one! The mill was uninjured, the storm coming from the south and southwest, from which sides it is sheltered. The din and uproar were terrifying and truly awful. Large trees snapped like toothpicks, broken limbs and timber were flying about and crashing around us, and in the inky darkness every sound was intensified and made more mysterious. Our tent was a sight, for everything that was up fell down and everything that was out fell in. We simply waited in the dark, pushing with all our might, but expecting it to cave in every moment."

Supreme Court Decisions

Further sustaining the income tax law, the Supreme Court, in construing the clause relating to incomes from mining companies, upheld the Government's contentions that profits taken from mines, even though reducing the actual physical value of the mines, are taxable.

John R. Stanton, a stockholder, had sought an injunction against the Baltic Mining Company to prevent its paying, "at the source," income taxes upon his gross profits. The decision in full follows:

As in Brushaber *vs.* Union Pacific Railroad Company, this case was commenced by the appellant as a stockholder of the Baltic Mining Company, the appellee, to enjoin the voluntary payment by the corporation and its officers of the tax assessed against it under the Income Tax section of the Tariff Act of October 3, 1913 (38 Stat. 166, 181). As the grounds for the equitable relief sought in this case so far as the question of jurisdiction is concerned are substantially the same as those which were relied upon in the Brushaber case, it follows that the ruling in that case upholding the power to dispose of that controversy is controlling here and we put that subject out of view.

Further also like the Brushaber case this is before us on a direct appeal prosecuted for the purpose of reviewing the action of the court below in dismissing on motion the bill for want of equity.

The bill averred: That, under and by virtue of the alleged authority contained in said Income Tax law, if valid and constitutional, the respondent company is taxable at the rate of 1 per cent upon its gross receipts from all sources, during the calendar year ending December 31, 1914, after deducting (1) its ordinary and necessary expenses paid within the year in the maintenance and operation of its business and properties and (2) all losses actually sustained within the year and not compensated by insurance or otherwise, including depreciation arising from depletion of its ore deposits to the limited extent of 5 per cent of the 'gross value at the mine of the output' during said year." It was further alleged that the company would if not restrained make a return for taxation conformably to the statute and would pay the tax upon the basis stated without protest and that to do so would result in depriving the complainant as a stockholder of rights secured by the Constitution of the United States as the tax which it was proposed to pay without protest was void for repugnancy to that Constitution. The bill contained many averments on the following subjects which may be divided into two generic classes: (A) Those concerning the operation of the law in question upon individuals generally and upon other than mining corporations and the discrimination against mining corporations which arose in favor of such other corporations and individuals by the legislation, as well as discrimination which the provisions of the act operated against mining corporations because of the separate and more unfavorable burden cast upon them by the statute than was placed upon other corporations and individuals— averments all of which were obviously made to support the subsequent charges which the bill contained as to the repugnancy of the law imposing the tax to the equal protection, due process and uniformity clauses of the Constitution. And (B) those dealing with the practical results on the company of the operation of the tax in question evidently alleged for the purpose of sustaining the charge which the bill made that the tax levied was not what was deemed to be the peculiar direct tax which the Sixteenth Amendment exceptionally authorized to be levied without apportionment and of the resulting repugnancy of the tax to the Constitution as a direct tax on property because of its ownership levied without conforming to the regulation of apportionment generally required by the Constitution as to such taxation.

We need not more particularly state the averments as to the various contentions in class (A), as their character will necessarily be made manifest by the statement of the legal propositions based on them which we shall hereafter have occasion to make. As to the averments concerning class (B), it suffices to say that it resulted from copious allegations in the bill as to the value of the ore body contained in the mine which the company worked and the total output for the year of the product of the mine after deducting the expenses as previously stated, that the 5 per cent deduction permitted by the statute was inadequate to allow for the depletion of the ore body and therefore the law to a large extent taxed not the mere profit arising from the operation of the mine, but taxed as income the yearly product which represented to a large extent the yearly depletion or exhaustion of the ore body from which during the year ore was taken. Indeed, the following alleged facts concerning the relation which the annual production bore to the exhaustion or diminution of the property in the ore bed must be taken as true for the purpose of reviewing the judgment sustaining the motion to dismiss the bill.

"That the real or actual yearly income derived by the respondent company from its business or property does not exceed $550,000. That, under the Income Tax, the said company is held taxable, in an average year, to the amount of approximately $1,150,000, the same being ascertained by deducting from its net receipts of $1,400,000 only a depreciation of $100,000 on its plant and a depletion of its ore supply limited by law to 5 per cent of the value of its annual gross receipts and amounting to $150,000;

whereas, in order properly to ascertain its actual income $750,000 per annum should be allowed to be deducted for such depletion, or five times the amount actually allowed."

Without attempting minutely to state every possible ground of attack which might be deduced from the averments of the bill, but in substance embracing every material grievance therein asserted and pressed in argument upon our attention in the elaborate briefs which have been submitted, we come to separately dispose of the legal propositions advanced in the bill and arguments concerning the two classes.

Class A. Under this the bill charged that the provisions of the statute "are unconstitutional and void under the Fifth Amendment, in that they deny to mining companies and their stockholders equal protection of the laws and deprive them of their property without due process of law," for the following reasons:

(1) Because all other individuals or corporations were given a right to deduct a fair and reasonable percentage for losses and depreciation of their capital and they were therefore not confined to the arbitrary 5 per cent fixed as the basis for deductions by mining corporations.

(2) Because by reason of the differences in the allowances which the statute permitted the tax levied was virtually a net income tax on other corporations and individuals and a gross income tax on mining corporations.

(3) Because the statute established a discriminating rule as to individuals and other corporations as against mining corporations on the subject of the method of the allowance for depreciations.

(4) Because the law permitted all individuals to deduct from their net income dividends received from corporations which had paid the tax on their incomes, and did not give the right to corporations to make such deductions from their income of dividends received from other corporations which had paid their income tax. This was illustrated by the averment that 99 per cent of the stock of the defendant company was owned by a holding company and that under the statute not only was the corporation obliged to pay the tax on its income, but so also was the holding company obliged to pay on the dividends paid it by the defendant company.

(5) Because of the discrimination resulting from the provision of the statute providing for a progressive increase of taxation or surtax as to individuals and not as to corporations.

(6) Because of the exemptions which the statute made of individual incomes below $4,000 and of incomes of labor organizations and various other exemptions which were set forth.

But it is apparent from the mere statement of these contentions that each and all of them were adversely disposed of by the decision in the Brushaber case and they all therefore may be put out of view.

Class B. Under this class these propositions are relied upon:

(1) That as the Sixteenth Amendment authorizes only an exceptional direct income tax without apportionment, to which the tax in question does not conform, it is therefore not within the authority of that Amendment.

(2) Not being within the authority of the Sixteenth Amendment the tax is therefore, within the ruling of Pollock *vs.* Farmers' Loan & Trust Company, 157 U. S. 429; 158 U. S. 601, a direct tax and void for want of compliance with the regulation of apportionment.

As the first proposition is plainly in conflict with the meaning of the Sixteenth Amendment as interpreted in the Brushaber case, it may also be put out of view. As to the second, while indeed it is distinct from the subjects considered in the Brushaber case to the extent that the particular tax which the statute levies on mining corporations here under consideration is distinct from the tax on corporations other than mining and on individuals which was disposed of in the Brushaber case, a brief analysis will serve to demonstrate that the distinction is one without a difference and therefore that the proposition is also foreclosed by the previous ruling. The contention is that as the tax here imposed is not on the net product but in a sense somewhat equivalent to a tax on the gross product of the working of the mine by the corporation, therefore the tax is not within the purview of the Sixteenth Amendment and consequently it must be treated as a direct tax on property because of its ownership and as such void for want of apportionment. But aside from the obvious error of the proposition intrinsically considered, it manifestly disregards the fact that by the previous ruling it was settled that the provisions of the Sixteenth Amendment conferred no new power of taxation but simply prohibited the previous complete and plenary power of income taxation possessed by Congress from the beginning from being taken out of the category of indirect taxation to which it inherently belonged and being placed in the category of direct taxation subject to apportionment by a consideration of the sources from which the income was derived, that is by testing the tax not by what it was—a tax on income, but by a mistaken theory deduced from the origin or source of the income taxed. Mark, of course, in saying this we are not here considering a tax not within the provisions of the Sixteenth Amendment, that is, one in which the regulation of apportionment or the rule of uniformity is wholly negligible because the tax is one entirely beyond the scope of the taxing power of Congress and where consequently no authority to impose a burden either direct or indirect exists. In other words, we are here dealing solely with the restriction imposed by the Sixteenth Amendment on the right to resort to the source whence an income is derived in a case where there is power to tax for the purpose of taking the income tax out of the class of indirect to which it generically belongs and putting it in the class of direct to which it would not otherwise belong in order to subject it to the regulation of apportionment. But it is said that although this be undoubtedly true as a general rule, the peculiarity of mining property and the exhaustion of the ore body which must result from working the mine, causes the tax in a case like this where an inadequate allowance by way of deduction is made for the exhaustion of the ore body to be in the nature of things a tax on property because of its ownership and therefore subject to apportionment. Not to so hold, it is urged, is as to mining property but to say that mere form controls, thus rendering in substance the command of the Constitution that taxation directly on property because of its ownership be apportioned, wholly illusory or futile. But this merely asserts a right to take the taxation of mining corporations out of the rule established by the Sixteenth Amendment when there is no authority for so doing. It moreover rests upon the wholly fallacious assumption that looked at from the point of view of substance a tax on the product of a mine is necessarily in its essence and nature in every case a direct tax on property because of its ownership unless adequate allowance be made for the exhaustion of the ore body to result from working the mine. We say wholly fallacious assumption because independently of the effect of the operation of the Sixteenth Amendment it was settled in Stratton's Independence *vs.* Howbert, 231 U. S. 399, that such a tax is not a tax upon property as such because of its ownership, but a true excise levied on the results of the business of carrying on mining operations. (pp. 413 *et seq.*).

As it follows from what we have said that the contentions are in substance and effect controlled by the Brushaber case and in so far as this may not be the case are without merit, it results that for the reasons stated in the opinion in that case and those expressed in this, the judgment must be and it is affirmed.

GOVERNMENT EXPERT ENSNARED BY LURE OF THE ARCTIC

Sumner S. Smith has returned to Alaska. Two months enforced stay in Washington on official business was a hardship to him greater than hitting the trail under the northern lights in the depth of winter. The asphalt and cement pavements stove him up. The electric lights hurt his eyes. The buildings obscured his view. The rays of the sun were too nearly vertical. No blubber was served at the eating houses. So Sumner S. was about to pine away when Director Manning, of the Bureau of Mines arranged it so he could hurry back and be revived by the rays of the midnight sun.

Washington is fairly familiar with some types of returned Alaskans. Miners who strike it rich generally spend some of their time and money here. They seem to enjoy it until their money is gone, at least. Or it is possible that they may not sober up long enough to realize the disadvantages of being in the midst of civilization. Mr. Smith's case is different. He is a government expert looking after the division of coal lands into proper units. He does not drink. He gets as much salary when he is here as he does when he is bouncing from rock to rock on his dog-drawn sled. While it is inexplicable to his friends here there is no question that Mr. Smith is firmly in the toils of the lure of the Arctic.

WASHINGTON DELEGATION ENJOYS INSTITUTE MEETING

Washington members of the American Institute of Mining Engineers who attended the annual session of the Institute in New York last month, are enthusiastic over the generous manner in which they were entertained and the interest that marked the assemblage.

George Otis Smith, director of the Geological Survey, made this comment about the meetings:

"There was a large and enthusiastic attendance which indicates that the increased activities of the mineral industry are not detracting in any degree from the technical subjects which make up the basic material of the progress of the Institute.

"Preparedness, to a certain extent, was the keynote of the meeting. It is gratifying to those interested in the mineral industry to observe the new appreciation of the extent to which the nation must depend upon this resource whether it be in times of peace or those of war."

MINE MANAGER SAVES $50,000 ON HIS EXPLOSIVES

In an article on "Explosives in Engineering," Charles E. Munroe, of the Bureau of Mines, says:

"A study was made of bore holes in blasting operations by Clarence Hall and W. O. Snelling. Their results and conclusions were published as Technical Paper No. 17 of the Bureau of Mines under the title, 'The Effect of Stemming on the Efficiency of Explosives.' It was naturally of interest to learn that a manager of a considerable mine reported a saving of $50,000 in his explosives account in a single year by following the methods for using stemming taught by this research."

COAL PRODUCTION SLACKENS; OPEN WINTER CHIEF CAUSE

Coal production, which started out the first of the year at a tremendous rate, is dropping off considerably, according to figures being received by the Geological Survey. This is due largely to the weather conditions. The open winter has resulted in a considerable decrease in the amount of domestic coal used. The freight embargoes on the railroads also have had a decided influence in working the havoc which has overtaken the coal market. The railroads of the United States use twenty-five per cent of the coal production, while domestic consumers use another twenty-five per cent. The remaining fifty per cent is consumed in coke manufacturing, gas making, at factory and industrial plants, in smithing, and for exports.

Mineral Paints to Cost More

Prices on paints are going up, due to the increase in the demand for crude zinc and lead whites. Zinc white particularly has not been affected by the general increase in price until very recently.

Current Federal Legislation

Thus far 16,927 bills have been introduced in Congress, of which 4,653 have been introduced in the Senate and 12,274 in the House of Representatives. Of these 561 were introduced in the Senate and 1,704 in the House during the month of February.

Of the bills referred to in our last issue, H. R. 153 is still under consideration by the Senate Committee on Education and Labor, and it is believed will be so amended by the committee as to prevent entirely the possibility of duplication of safety investigations in mining operations.

H. R. 406 is still before the Senate Committee on Public Lands. A considerable number of hearings have been held, at which the principal appearances have been on behalf of the oil operators. In another column will be found the statement of Edward J. Holmes, of Boston, Mass., which is typical of many of the statements which have been made. It is anticipated that the bill will be reported from the committee early in March.

H. R. 408 is upon the Senate Calendar waiting consideration.

SENATE BILLS

S. 4447, by Mr. Walsh, provides for an appropriation of $10,000,000, $1,000,000 to be spent each year for ten years for the construction of roads within or partly within the national forests, the expenditure in each state being limited to ten per cent of the probable income from the national forests within the county or counties in which such roads are constructed. Such expenditure is to be made in cooperation with the State, Territory or County upon some equitable basis to be approved by the Secretary of Agriculture.

S. J. Res. 100, by Mr. Lane, requires the Secretary of the Interior to adopt a royalty system in place of bonus and royalty system now in effect for the sale of leases on the oil lands of the Osage Indians in Oklahoma.

HOUSE BILLS

H. R. 6780, by Mr. Kahn, provides for the location and entry under the placer mining laws of the United States of lands containing deposits of asbestos.

H. R. 9687, by Mr. Small, provides for the exemption from compulsory pilotage barges in tow of steam vessels navigated by government pilots. Numerous hearings have been held by the Committee on Merchant Marine and Fisheries. A favorable report upon this bill is expected and its enactment will relieve coal carrying barges entering ports upon the payment of pilot charges required by state laws.

H. R. 10585, by Mr. Rainey, provides for the creation of a United States Tariff Commission to consist of five members who shall be allowed appointed by the President, not more than three of whom shall be members of the same political party. It shall be the duty of the commission to investigate the administration and fiscal effects of custom laws of this country now in force or to be hereafter enacted; the relations between the rates of duty on raw materials and finished products and the advantage and effects of the custom tariff laws and their relation to federal revenue. The Commission is also empowered to investigate commercial treaties and all matters relating to unfair competition of foreign industries. It is also provided that the Commission shall act in cooperation with the Treasury Department, Department of Commerce and the Federal Trade Commission, and that these departments shall cooperate with the commission.

H. R. 10830, by Mr. Foster, provides that all fuel purchased by the government shall be upon the recommendation of the Bureau of Mines, except the fuel for the Navy, and that the Bureau of Mines shall be charged with the further duty of recommending plans for the installation of fuel burning equipment and to investigate the methods of purchase and means of handling storage and using of fuel for the use of the government. Seventy-five thousand dollars is to be appropriated to carry out the provisions of this act.

H. R. 11073, by Mr. Church, provides for the leasing by the Interior Department of any lands within the limits of any Indian Reservation in the State of Claifornia for mining purposes, including oil, coal, asphalt, and other minerals. The Secretary of the Interior is directed to provide rules for the leasing of such lands, but the bill provides that leases shall be made to correspond in extent of area to the present mining laws of the United States except that no lease shall be made to cover more than 640 acres. The bill further provides that lessees pay for such land $100 per annum for the first and second years, $200 for the third and fourth years, and $500 per annum for each succeeding year, as advance royalty, such payments to be made in advance.

H. R. 11162, by Mr. Taylor, of Colorado, provides that incorporated cities and towns shall have the right to purchase from the government public lands not reserved for other use, not exceeding one-quarter section, for cemetery or sewerage purposes; not exceeding 640 acres for the protection of its water supply and not exceeding 640 acres for public park purposes. The bill provides that the lands shall revert to the Federal Government in case the town or city shall fail to use same for the purposes granted.

H. R. 11258, by Mr. Taylor, of Colorado, provides for the sale of 250,000 acres of non-irrigable, non-mineral, or non-timber lands in each of the public land states, the area not exceeding 320 acres to one person, ten per cent of the purchase price to be paid at the time of sale, and the balance in ten annual installments. Each purchaser is required within five years to cultivate one-half of the area purchases, to develop a water supply and to spend at least $1,000 in improvements. One-half of the money so paid is to be set aside for a public road within the limits of the state.

H. R. 11712, by Mr. Hayden, provides for the establishment of game sanctuaries in national forests.

H. R. 12040, by Mr. Kent, provides for the classification of public lands of the United States, according to the principal value or use of the surface thereof, and that all patents hereafter issued shall expressly reserve all deposits of phosphate, oil, asphaltum, natural gas, coal, lignite or associated minerals.

BUREAU OF MINES LOSES APPARATUS IN FIRE

In the destruction of Morse Hall at Cornell University by fire, all the apparatus of the Bureau of Mines, which was used in the extensive experimentation in progress there, was destroyed.

Only one room of the hall escaped danger. This contained the electric generators. Due to the fact that this apparatus was not damaged it will be possible for a considerable portion of the cooperative work of the Bureau of Mines there to be continued.

Another fortunate incident of the fire was the fact that H. W. Gillette, the alloy chemist of the Bureau of Mines, stationed at Cornell, had duplicates of all of his records. The original records were destroyed in the fire, but it has been the practice of Mr. Gillette to send a duplicate record of each month's work to Dr. Parsons, head of the Division of Mining Technology.

SOAPSTONE OUTPUT INCREASES; VIRGINIA LARGEST PRODUCER

As to soapstone, Virginia is the greatest producer. It is of a fine quality, and the output applies to a very large market throughout the United States.

New England, the former chief source of supply, is still producing a great deal of soapstone, but most of that trade in recent years has gone to Virginia. The production of this increased decidedly during 1915.

The great bulk of soapstone used goes into the manufacturing of laundry tubs. A considerable quantity is used in making tables for chemicals, photographic and other laboratories where acids are employed. Formerly the supply in New England was used in making stoves and this practice continues to a rather surprising extent.

An increasing quantity of soapstone is used for plates in fireless cookers.

RUSSIA MAY LIFT HER EXPORT TAX ON PLATINUM

Platinum continues to be almost unobtainable at any price in the United States. Hope is expressed in well informed quarters that the high Russian export tariff may be raised. This tariff was ordered before the war with the idea that it would lead to the refining of raw platinum in Russia. Quite contrary to some published statements, it was not a result of the war.

As the war seems to preclude the erection of any refineries at present, and owing to the large stocks of platinum held by Russian branches, it is considered very probable that the export tax will be removed and allow the sale of the stocks now on hand. Russian bankers have been furnishing money to the extent of 80 per cent of the value of the raw platinum.

Some suggest that Russia may be holding this platinum to insure an ample supply for her allies, and to be certain of preventing its reaching her enemies.

So far as is known here the gold and platinum miners in Russia are still exempt from military service. The price of platinum has increased 50 per cent. With the assurance of such good prices and an abundance of labor, it is expected that much new ground is being opened there.

A new American producer is expected to come in this year. It is the Rambler mine in Wyoming. Improved concentrating machinery is being established on this property which is located in Laramie County.

GRAPHITE INDUSTRY BADLY UPSET BY THE WAR

No industry has been stirred more deeply by the war than has the distribution of graphite, according to E. S. Bastin, of the United States Survey.

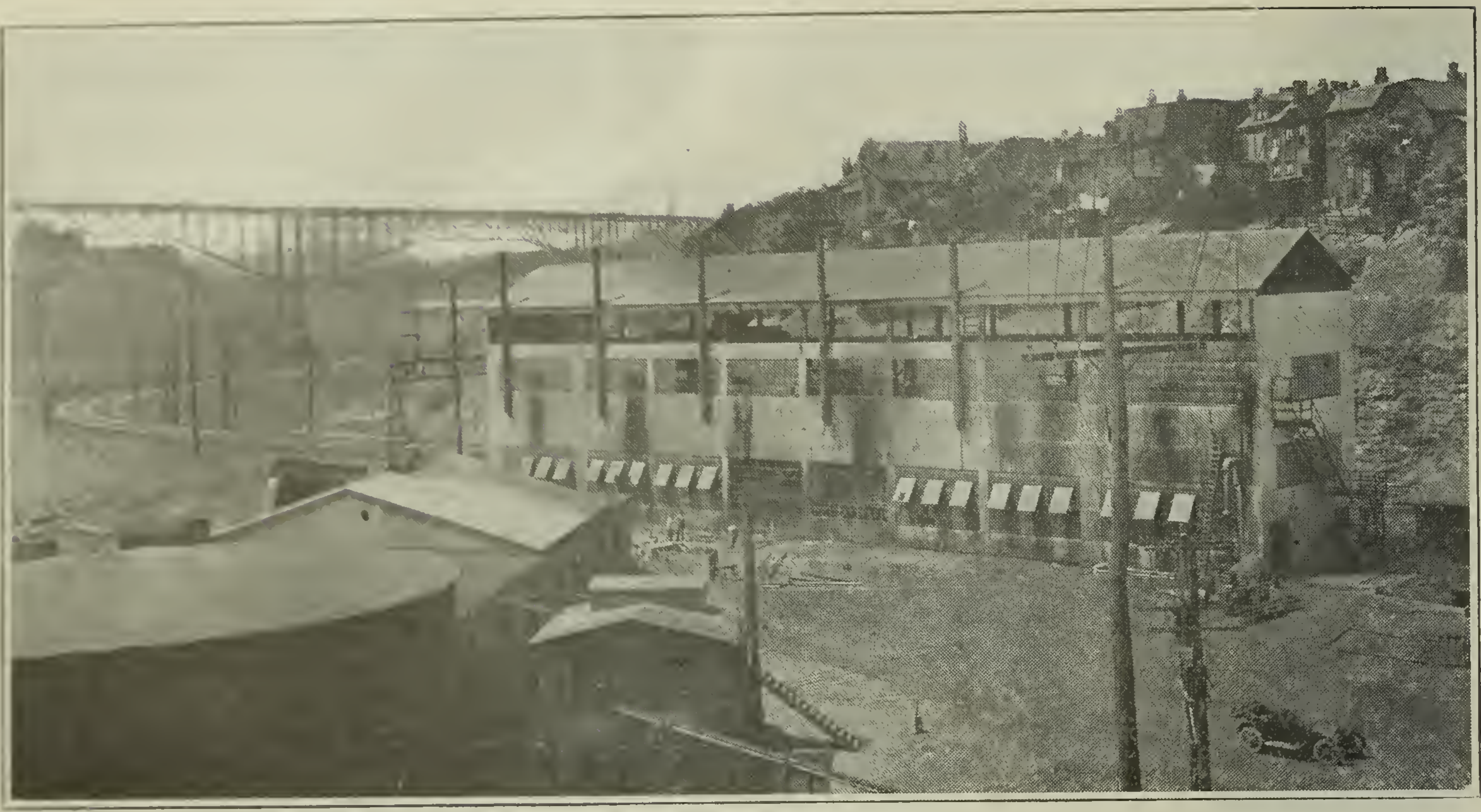
Most of the world's graphite, previous to the war, came from Ceylon. This source of supply has been interferred with largely. The demand for graphite in this country has been extremely heavy since the opening of the war. This has stimulated the mining of graphite in this country and Mexico.

Mexico, for a number of years, has been furnishing practically all of the pencil graphite used in the world. The cutting off of this supply has caused Germany and Austria to reopen Bavarian and Bohemian deposits.

CORRESPONDENT POINTS OUT AN INJUSTICE

The following letter has reached Washington:

"I hope that Congress will deal liberally with the Bureau of Mines. I understand its appropriation last year just equaled the amount appropriated by Congress for investigations in the treatment of hog cholera."



WHERE RITTMAN IS WORKING

In this plant at Pittsburgh the Bureau of Mines, in connection with the Aetna Chemical Company, is conducting experiments of international interest

BUREAU OF MINES GIVES OUT DETAILS OF RITTMAN PROCESS

The Bureau of Mines has just published Bulletin 114, dealing with the manufacture of gasoline and benzene-toluene by means of the processes devised by Dr. Walter F. Rittman, chemical engineer of the Bureau. The bulletin gives the data for the laboratory experiments which resulted in the discovery of the processes, and also gives a detailed description of the plant and equipment developed for the operation of the processes on a commercial scale.

The growing difficulty in meeting the demand for motor fuels from the existing supplies of crude oils by ordinary refining methods has led to a great deal of experimentation with a view to increasing these yields by processes involving the cracking of heavy oils into lighter and lower boiling oils.

The Rittman processes differ from the great majority of prior processes. The oil to be treated is introduced in small quantities into the top of a vertical tube which is highly heated by means of the combustion of natural gas, fuel oil, or any other suitable fuel. The oil is fed in slowly so as to cause it to be instantaneously gasified. The gases so produced are then superheated or cracked and the products of the cracking reaction withdrawn from the lower portion of the tube, and condensed in the usual way. The advantages claimed for this method of treatment are: the hydrocarbon material is fully expanded so that if there is a leakage of joints or a giving way of the container no danger results, much higher temperatures and pressures can be used with greater safety than in liquid vapor processes; the speed of reaction incident to high temperatures can be readily attained; the control conditions can be varied at will.

BENEFITS OF FIRST-AID TRAINING POINTED OUT

Washington Times.

A convention of medical experts held in Washington last summer has borne fruit in the appointment, by President Wilson, of a board of first-aid standardization. At the time of the convention figures were presented which indicated a surprising loss of limb and life in industrial and transportation work because of a lack of knowledge of first aid measures among those who ought to have such knowledge.

A principal factor in retarding the dissemination of such knowledge was that physicians themselves have been in dispute about proper first-aid packages to be made available to industrial workers and railroad men. Too often these laymen have been equipped with material only the trained physicians could apply.

The standardization board is to work out a satisfactory first-aid package to be placed in the hands of laymen, and another to be used by physicians. In view of the industrial accidents in this country, such an effort is more of a boon than might seem at first sight.

This training will be of marked benefit if this country ever is called upon to go to war. European nations have learned that field hospitals service and relief of the wounded are matters of primary inportance. Training large numbers of physicians and laymen in the art of applying first-aid measures will be of inestimable value in time of stress.

Employs 446 Persons

At the close of 1915 there were 446 persons on duty in the Bureau of Mines.

AGRICULTURAL POSSIBILITIES OF ALASKA SET FORTH IN GOVERNMENT REPORT

Opportunities for Farming Shown to Exist in Many Parts of Northern Territory—Susitna Region Offers Specially Favorable Sites

A reconnaissance soil survey of a vast area in Alaska to investigate the agricultural possibilities of that territory has recently been made, and the results of this work will shortly be published in a report by the Bureau of Soils of the United States Department of Agriculture. The report comprises 202 pages and contains thirty-eight page plates and four maps. It describes the climate, soils, crops, and other conditions bearing upon the possibilities of agricultural development in Alaska, and in addition discusses such incidental subjects as settlement, natural resources, physiography, drainage, means of communication, and a comparison of Alaska with parts of Siberia and Finland.

Mining in Alaska will be facilitated greatly by the growth of agriculture.

The report says in part:

"The existence of a vast mountainous area along the southern coast of Alaska, with numerous lofty, snow-covered peaks and huge glaciers, necessarily unfit for human habitation, is apt to give one unfamiliar with the complexities of the topography and climate of the country as a whole the impression that Alaska is a region of inhospitable mountains, glaciers, and snow, without farming possibilities. In a measure this is true, for there are in the territory immense areas of rugged mountains, including the loftiest peakes upon the North American continent, the great wastes of snow-clad and precipitous land, wide stretches of bleak tundra and mountain skirting the Arctic Ocean, innumerable bodies of water-soaked Muskeg, and many glaciers of almost incredible magnitude. Nevertheless there are millions of acres of relatively low, smooth land and gentle slopes in various parts of the country which are topographically and climatically suited to farming. That this is true is not a matter of conjecture, for many valuable food products both for man and animal are now being successfully grown. Farming in a region so far north may seem astonishing until one is acquainted with the equable summer climate, the long hours of summer daylight, and the good quality of the soil."

PIONEER CONDITIONS PREVAIL

It is pointed out, however, that while the development of a successful agriculture throughout an enormous area in Alaska is possible, it must be remembered that "as yet strictly pioneer conditions obtain, that settlement is largely confined to communities in the vicinity of mining camps, that much of the country is inaccessible owing to the absence of roads and railroads, and that home markets are restricted by the present small population."

"Every indication is that agricultural development must be gradual, must grow with the construction of highways and railways, with the development of mining industries and accompanying increase of population. If large numbers, without sufficient capital, should 'stampede' to these lands with the idea of immediately establishing profitable farms for themselves, it is believed that there would be only disappointment for many. A careful study of the conditions before undertaking farming operations here is therefore urgently advised. The prospects of success for farming depend, so far as sale of surplus products is concerned, upon finding a local market among a population attracted by mining resources and fisheries. In other words, these regions of Alaska will probably not for some time export agricultural products, at least not on an important scale. Exportation of such products must await the building of a system of railways and highways and probably, also, the establishment of cheaper transportation."

The report deals with three general areas, the Cook Inlet-Susitna region, the Yukon-Tanana region, and the Copper River regions.

COOK INLET-SUSITNA REGION

The most important is the Cook Inlet-Susitna region, the agricultural lands of which are comprised, says the report "in the plainlike country and adjacent beach lands bordering Cook Inlet from Kachemak Bay northward and extending up the Susitna and Matanuska Valleys. The unfavorable climate and topography of the surrounding mountainous country restricts the farming possibilities to this low country, the approximate area of which is 6,000 square miles. At least one-third of this area, amounting to a little more than a million and a quarter acres (1,296,000 acres, the lowest estimate), consists of arable land possessing topographic and drainage characteristics and chemical and physical properties quite favorable to farming. About one-half of this good land occurs in the Susitna and Matanuska Valleys.

"The climate and soil make possible the establishment of an important agriculture in the Cook Inlet-Susitna Region. Development will follow along pioneer lines at first, leading eventually to the establishment of many comfortable homes, supported largely by the products of the farm. The possibilities of raising stock and dairying point to the furtherance of agriculture, eventually, to a position of importance considerable beyond a self-supporting stage. The building of a railroad through the Susitna and Matanuska valleys will make accessible a large area of good farming land, and, unquestionably, settlement will follow, probably at a rapid rate. Already 150 homesteads have been registered along Knick Arm, and others have been taken up. A number of prospectors and miners, most of whom previously have not been identified with agriculture, are now supporting themselves in the neighborhood of Knick largely with the products of their farms, assisted by the earnings of a few days' outside work during the summer."

YUKON-TANANA REGION

"The Yukon-Tanana region comprises (1) the lowlands of the lower Tanana River, from the vicinity of McCarty to the Yukon River, known as the Tanana Flats; (2) the lowlands of the Yukon River, chiefly comprised in the Yukon Flats; and (3) the area of highlands or hill country between the Tanana and Yukon lowlands, the Yukon-Tanana uplands. In discussing the area as defined above, it is not meant that this includes all of the agricultural land of interior Alaska. This is simply the area to which the investigations were specifically directed. Farming lands are reported to exist in considerable areas along the upper Tanana River, and good grazing is said to be available about the headwaters of White River, in the Mentasta Pass section and in other places outside the limits of the area described.

"On the soils of the Tanana bottoms good crops of vegetables and grain hay are produced. Immense quantities of hay and good grazing can be derived from the native grasses which thrive on these soils. In addition, large quantities of grain hay and root-crop forage can be easily grown.

"In the hills north of the Tanana bottoms is found the best soil seen in Alaska. This is a deep, mellow silt loam (Fairbanks silt loam) having good drainage and moisture-holding capacity. It occurs on the lower slopes, and is largely susceptible of easy cultivation. There are approximately a half million acres of this valuable soil. This type of soil is the same as that at the Fairbanks experiment station, where such good results have been had with grains and potatoes. On the southward-facing slopes it yields over 200 bushels of potatoes per acre, without fertilization. Early varieties of oats and barley mature in normal years. Wheat and rye also have matured at the Rampart and Fairbanks stations. All varieties of grain give good yields of hay on this soil even in years of early frost. Turnips, cabbage, beets, carrots, lettuce, celery, and several other vegetables are grown with unusual success, both as regards quality and yield. Native redtop grass springs up quickly immediately following the removal of timber.

"There are still larger areas of other cultivable soils on the slopes of the hill country. These are not so deep as the Fairbanks silt loam, but they produce good crops of excellent potatoes, various vegetables, grain, and grass. Probably 1,500,000 acres of such land exists in the country between the Tanana and Yukon Rivers. Other soils of agricultural possibilities are found in the bottoms of the small streams and on the bench lands of the region."

COPPER RIVER REGIONS

The Copper River regions are the Copper River Basin and the Copper River Delta. "The Copper River Basin, or Copper River Plateau, is a broad expanse of plainlike country almost completely inclosed by mountains. It is bordered on the north by the Alaska Range, on the west by the Talkeetna Mountains, on the south by the Chugach Mountains, and on the east by the Wrangell Mountains."

The Copper River Delta occurs where "Copper River enters the Pacific Ocean a short distance northwest of Controller Bay, through a labyrinth of channels, dividing and reuniting to form an interminable network of passages, 'sloughs,' with almost countless intervening islands and bars. The low, flat delta through which these numerous distributaries flow is somewhat triangular in shape; with its apex 30 miles inland, between the fronts of Childs and Miles Glaciers. There is a large extent of country in the upper Copper River Basin, northward from the vicinity of Copper Center, which has a quite favorable topography for agricultural operations. The principal soil here, however, is not so favorable, being predominantly of a clayey character, and so stiff and probably cold-natured that it would be difficult to till and crops likely would be slow to reach maturity on it. Heavy teams and tools would be required to work such land. Furthermore, the climate of the region appears to be not so favorable as that of either the Cook Inlet-Susitna or the Yukon-Tanana regions. Vegetables and grain hay, however, are being successfully grown on the bottom-land soils and the more loamy types of the uplands. Some cattle have been raised at various places in the region along the Valdez-Fairbanks road. Stock raising and dairying would likely be found the most remunerative types of farming.

"Practically the entire delta is unsuited to agriculture, owing to the poor drainage, the liability to disastrous floods, and the inferior character of the soil. Near the glacier fronts the glacial plains, covered with freshly discharged glacial débris, are mostly bare of vegetation, but farther away there is much alder and scrub willow and a variety of water-loving grasses."

DECREASE IN MINE ACCIDENTS FOLLOWS U. S. SAFETY WORK

In the year 1907 the first appropriation was made by Congress for "conducting such investigations as would increase safety and efficiency in mining operations." For several years prior there had been a steady increase in mining accidents of approximately 25 per cent annually. The following tabular statement tells a story of which all the friends of the movement should feel proud:

Year	*Production (short tons)*	*Employed*	*Killed*	*Rate, per 1000 employed*	*Killed, per million tons*
1907	480,363,424	680,492	3,242	4.81	6.78
1908	415,842,698	690,438	2,445	3.60	5.97
1909	460,814,616	666,552	2,642	3.96	5.73
1910	501,596,378	725,030	2,821	3.89	5.62
1911	496,371,126	728,348	2,656	3.65	5.35
1912	534,466,580	722,662	2,419	3.35	4.53
1913	570,048,125	747,644	2,785	3.73	4.89
1914	513,525,477	763,185	2,454	3.22	4.78
1915[1]	518,000,000[2]	767,553[1]	2,264	2.95	4.37

---

[1] Subject to change.

[2] Estimated by U. S. Geological Survey.

NEW USES ARE INCREASING THE DEMAND FOR ALUMINUM

One needs only to glance at the increasing consumption of aluminum to get an idea of its increasing use. The variety and extent of its possible uses may be inferred from a consideration of its properties. Its specific gravity is only 2.6 to 2.7 as compared with water taken as 1, while that of steel is 7.7 and that of brass more than 8. It possesses malleability, ductility, and considerable tensile strength. It alloys fairly easily with other metals and strongly resists the influence of iron, water, and vegetable acids. For these reasons it is being used on an increasing scale in making kitchen utensils, surgical appliances, jewelry, and fancy articles, and bearings for machinery. This information is from W. C. Phalen of the United States Geological Survey. He says further:

"Another use, relatively unexploited, is in the decoration of interiors; that is, in supplanting wood in modern business offices. About the only articles that are still made of wood in the modern office are the desks and chairs, and it is more than likely that these soon will be supplanted by metal in response to the requirements of fireproof construction and furnishings. Painted sheet steel is now a favorite material for interior construction, but aluminum will probably be found quite as satisfactory.

"Aluminum is now used in ways which do not attract very much attention, but in which large quantities of the metal are consumed—for example, the manufacture of novelties.

"Powdered metal, known as aluminum bronze powder, is used in painting, printing, and lithographing, as a constituent of explosives and as a patented source of heat. A very modern use is as a casing for explosives. Aluminum foil, which has hitherto been largely imported, is now manufactured here and is meeting with considerable success. Perhaps one of the greatest advances made in 1914 has been in the quality of the aluminum sheet manufactured in the United States. Aluminum sheet has a tendency to blister and to show other surface defects, but special efforts have been made to study the cause and remedies of these defects. These efforts have been so far successful that the sheet on the market today is of very superior quality.

"An investigation has been made concerning the influence of aluminum on Bessemer ingots and rails when added to the molds during the pouring of the steel. The work was done at the South Chicago works of the Illinois Steel Co., which furnished the material. Five ingots were of untreated Bessemer steel; eight were treated with aluminum varying from 1 to 10 ounces per ton of steel, and two of these ingots were treated with additions of ferrosilicon, equivalent to one-tenth and two-tenths of 1 per cent of silicon, respectively. These latter were rolled into rails. In summing up the benefits resulting from the addition of aluminum, Wickhorst says:

"'Ingots treated with aluminum added to the mold were of more even composition throughout than plain Bessemer steel. There was less positive segregation in the interior and upper parts of the ingot, but the negative segregation or soft center in the interior and lower parts of the ingot was about the same. There was a softening or negative segregation in the upper part of the wall of the plain ingot, while in the aluminum treated ingots the walls were of fairly even composition throughout the height of the ingot. The aluminum treated ingots had larger and deeper pipes than the plain steel, but had denser steel around the pipes.

"'Rails of plain steel had a brittle zone in the upper part of the bar, as disclosed by the drop test. In the rails of the aluminum-treated steel this zone was largely eliminated. Rails of plain steel contained their laminations close to the top end of the bar, while in aluminum-treated rails the interior laminations were found a considerable distance from the top end, varying from about 30 to 45 per cent of the weight of the ingot. In the transverse test of the base, rails of aluminum-treated steel showed a considerably greater transverse strength of the base and sag of the flange before breaking than the rails of plain steel with 0.61 per cent carbon and a little greater strength and sag of flange (than rails) with 0.45 per cent of carbon.'

"In a pamphlet issued late in 1913 by the British Aluminum Co. (Ltd.), a very complete and frank statement is given of the advantages and limitations of the metal aluminum in construction on a large scale. When aluminum first began to assume considerable industrial importance, two disadvantages militated against its rapid extensions: First, the initial capital expenditure, and second, constructional difficulties in any but the smallest vessels. According to the information contained in the pamphlet, the difficulty of high first cost has been annulled by a considerable reduction in the cost per ton in recent years, made possible by improved and extended manufacturing facilities. In this connection, the fact should not be lost sight of that the upkeep charge is low on the metal, which is especially free from corrosion, heavy handling, and frequent scouring.

"The temporary setback, due to constructional difficulties, has been effectively met by the introduction of the process of autogenous welding. The soldering of aluminum in a chemical plant is and has been unsatisfactory. It has at all times been a difficult and unreliable process, as it has introduced alloys of a different composition in the electro-chemical scale which have set up galvanic action with the resulting evils of electrolysis and subsequent corrosion. Aluminum does not lend itself to riveting, as its malleable nature and low yield points are serious obstacles to a sound and lasting joint where extremes of temperature and vibration are likely to be encountered; but by the process of welding, referred to above, aluminum vessels of any size or shape can now be made from the metal in its purest sheet form. It is stated that aluminum is suitable for practically all purposes in the chemical plant, provided it is not brought into contact with hydrochloric acid, halogen solutions, or caustic alkalies.

"The better known branches of the chemical industry in which aluminum vessels of large size are in use, are in the brewing industry; in the manufacture of varnish; in the preparation of foodstuffs, such as sirups, essences, and jams; in the refining of sugar; in the preparation of edible oils and fats, and of such fatty or vegetable acids as oleic, stearic and palmitic acids. It is also used by the soap and candle manufacturers; in certain branches of the explosive industry; in the construction of certain parts of the dye-works plant; and to an increasing extent in the production of hydrogen peroxide and formaldehyde, citric acid, and glycerine, and a host of less-known chemicals.

NEW YORK CONTINUES TO FURNISH BULK OF TALC

Talc, as heretofore has come very largely from the great mines at Gouveneur, N. Y., which for many years produced more talc than all the rest of the United States combined. This talc is of a fibrous character. This is due to its being derived by alteration from fibrous hornblend. This gives it a fibrous structure that makes it specially valuable in the manufacture of paper.

The production of talc is increasing in many places, but more especially in New England. Vermont is producing much larger quantities. North Carolina, Georgia and California also are producing considerably more than during previous years.

Forms Publications Committee

In order to give force and effect to the policy to be followed regarding the printing of all articles and papers by members of the Bureau of Mines, and to insure greater efficiency in the handling of such papers, a publication committee has been formed within the bureau to pass on all matter to be published.

Colorado Metal Mining Association

The annual meeting of the Colorado Metal Mining Association was held at Denver, February 12. The following officers were elected: President, Bulkeley Wells; First Vice-President, T. R. Henehen; Second Vice-President, George M. Taylor; Third Vice-President, George Argall; Secretary, M. B. Tomblin; Treasurer, A. M. Collins.

REVISION OF MINING LAWS SUBJECT OF NEW BILL

Modification of the apex law, new regulations for locating claims and tunnels sites are provided in a bill introduced in the House of Representatives by the chairman of the Committee on Mines and Mining, Dr. Martin D. Foster.

A tentative print of the bill only has been made. Dr. Foster declares that his measure is intended simply as a base on which to work. Consideration of it will begin as soon as the matters before Congress will permit of committee meetings. Little hope is held out for the passage of the measure at this session but Dr. Foster hopes to be able to have the bill in such shape, after the changes have been embodied which will be suggested, as to make it possible to pass it at the next session.

THE
MINING CONGRESS
JOURNAL

PUBLISHED EACH MONTH BY
THE AMERICAN MINING CONGRESS.
Munsey Building. Washington, D. C.

Subscription Rate, per year.............. $2 00
Single Copies........................... .20

Entered as Second Class Matter January 30, 1915, at the Postoffice at Washington, D. C.

MARCH 1916

EDITORIALS

A LESSON FROM THE COLORADO COAL STRIKE

It is very gratifying to find one federal committee appointed to investigate labor conditions reporting favorably. This may signify either that conditions are improving and are so far improved as to justify such favorable report, or that the committee referred to is more willing to do justice to the situation than some of its predecessors.

In either case the change is gratifying. It perhaps never can be said of any large body of workmen that all are living under the best possible conditions, but it should always be true that all those who are industrious and frugal are able to do so.

It is understood that the report of the committee sent by President Wilson to examine the Colorado situation is to the effect that conditions in the southern Colorado field, brought so sharply to public attention by the Ludlow horror, compare favorably and to advantage with any similar coal mining section in the country.

Perhaps in no previous industrial war has the public accepted so freely the criticisms of the employers and perhaps in none has this criticism carried more of injustice. The fact that the Rockefellers were largely interested in one of the Colorado companies involved in the strike furnishes ample excuse for many, heretofore believed to be above such contemptible pettifogging, to misrepresent the whole situation in order to make political capital by appeals to the masses, based on a misstatement of the facts.

Some, perhaps much, good has come from the bitter sacrifices made by both sides of the controversy. The lesson has been well learned that direct association between employer and employe is of mutual advantage, and that the bitter criticisms of one side of any controversy should not be accepted until all the facts are available.

Conditions in Colorado were not all they should have been, are not now, and probably never will be. When a coal mining camp with its usual mixture of foreigners, not speaking the English or any common language and but slightly acquainted with our political institutions, can reach model conditions most other communities will have qualified for the millennium and Gabriel's trumpet will put an end to the need of coal production.

Each side must learn toleration—each side must respect and obey the law. Intolerance frequently brings and sometimes justifies a resort to strikes; violations of the law sometimes bring and always deserve punishment. A strike conducted without violations of the law is a just weapon in the hand of labor. To take from labor this inherent right is to concede its right to demand employment. The right to work or refuse to work is as inherent as the right to employ or discharge. These are rights which must go hand in hand. To deny either is to deny the fundamental principle of freedom. The independence of the American workman is so fundamentally important that any violation of the principles which support it must be opposed with vehemence. In the end it will be found that the best results for both jointly can only be secured through the most perfect cooperation and that the rights of both sides can best be established without violation of the rules which protect society.

THE LEASING BILLS

The Senate Committee on Public Lands is now considering H. R. 406, entitled "an Act to authorize exploration for and disposal of coal, phosphate, oil, gas, potassium or sodium." Various statements on behalf of the oil land claimants, representing millions of dollars of invested capital have been made.

These statements while objecting, in a general way to the proposed leasing system, have been directed toward convincing the committee that some relief should be granted to the oil claimants which would afford protection to their investments.

The statement of Mr. Holmes, of Boston, appearing elsewhere in this issue, is typical and its perusal will convince any fair minded man that justice requires relief. Had it not been for Mr. Holmes' investment in a western enterprise it is probable that he too would have been one of the many who give approval to the radical changes which are being made in the public lands system of the United States.

The great development of oil production in the western States has been of untold advantage to the country as a whole. The larger part of this development would never have been made had it been anticipated that the Federal Government would undertake to establish a new system of land control, through which the legitimate investments of individuals would be endangered.

It is urged that the country's need for oil for defensive purposes justifies the reservation of sufficient oil to supply the possible Government needs. The MINING CONGRESS JOURNAL is convinced that undeveloped oil fields would be of little use to the country in time of peril. Without the development carried on by private individuals, willing to take enormous chances in the hope of securing extraordinary profits the oil reserves would be entirely unknown.

Surely there should be no question but that a beneficent Government will care for the interests of its citizens whose investments were made in good faith and under authority of then existing law. Anything short of this will be a rank injustice to the individuals who suffer and a lasting shame to the Government.

BUREAU OF MINES DOES NATION ANOTHER GOOD TURN

Another asset has been added to the nation's list by the Bureau of Mines. Through its experiments it has been possible to develop a kaolin of the highest quality in the United States. For the first time in the history of the country it is independent of other nations for this important mineral product as abundant American material can now be procured and substituted for English china clay.

Each individual doubtless has turned over a plate or a saucer and seeing "Austria," "France" or "Great Britain" stamped on the back has asked why more dishes are not made in America. Perhaps there would not have been so much curiosity aroused if these marks appeared on fine china only but much of the cheapest ware bears the same ear marks. Much white ware is now made in this country but largely from imported kaolin; as a result of the latest accomplishment of the Bureau of Mines it may be expected very soon that "Made in America from all American material" will begin to appear on the backs of our table ware.

Dishes, however, represent only a small portion of the kaolin that is consumed. Many thousand tons have been imported for use in the making of ornamental tiles and for sundry purposes.

Incidentally this work adds to the indebtedness of the American people to Dr. Chas. L. Parsons, the head of the division of mineral technology of the Bureau of Mines, under whose direction the work was done. Ira E. Sproat, the chemist who was in charge of the actual work, is a young man to whom much credit is due. Dr. Parsons in trying to side-step any of the credit for the achievement, is attributing much of it to Mr. Sproat. There also are the manufacturers who cooperated in giving the newly refined material practical tryouts. Dr. Parsons also speaks highly of the part they took in making the country independent of foreign kaolin.

MINING ENJOYS LITTLE PRESTIGE IN WASHINGTON

When Senator McCumber introduced his resolution calling on the Secretary of the Interior for detailed information regarding the production, consumption and price of gasoline, it is probable that he expected an exposé of manipulation, on which responsibility could be fastened for the recent increase in the price of gasoline.

Instead of some wily trick on the part of the "oil barons" it develops that the most natural thing in the world has happened. The demand has exceeded the supply.

Despite the conclusive nature of Mr. Lane's report there is still some tendency at the Capitol to believe that the figures have been juggled and that there is an enormous surplus of gasoline being carried, which is being fed out to the people at exorbitant prices.

While the oil miners have more influence in Washington than has any other class of mine operators, they have woefully few champions among the legislators. Why is it that there are no references to corn "barons," wheat "barons" and cotton "barons?" They have too many friends ready to champion them. Nothing suits the average lawmaker better than an opportunity to defend the farmer.

Of course there are no agricultural "barons" just as there are no mining "barons" or no lumber "barons." To call big operators in the latter two industries "barons" is done carelessly in Washington because there are few in Congress to spring up to defend the operators of these industries. Agricultural operators have plenty of champions; in fact nearly every legislator is their champion

We have discussed many times why agriculture has such preferential treatment by the government. Understand, we think it deserves all it gets, but we feel aggrieved that mining should not have the same recognition.

There is just one way to secure the recognition which the federal government owes the mining industry and that is for every man interested in the industry to make up his deficiency in numbers by close cooperative effort. At this session of Congress the House Committee on Mines and Mining refused the request of an industry that produces nearly as much new wealth as does agriculture. This would not have happened had the 90,000 mining men of the nation been in a position to express its resentment.

There is just one way in which the mining industry can put a stop to the unjust discrimination to which it is being subjected. The mine operators of the country must get together in one big organization, or a number of closely affiliated organizations, and command the respect of Congress and every other agency of the people by the united front that they present. It is to the interest of capital and labor alike to aid in any movement that will add something to the very little prestige that the mining industry enjoys at Washington.

HONORABLE SURRENDER

> "I am unalterably opposed to the whole principle of Federal leasing of mineral lands but in my present dilemma I am ready to consent to any plan which will protect the interests of the stockholders who have invested their money on my advice and who stand to lose their whole investment and much beside unless some relief is granted. I would crawl on my belly and kiss their feet to protect investments based on confidence in my judgment and integrity."

These are the words of a prominent oil man who is urging his Government not to so change the rules in the middle of the game as to rob investors of the legitimate profits of risky enterprises made under the protection of then existing laws.

The oil operators of California whose successful operations should make them most independent are ready to surrender. It took Great Britain a much longer time to convince the Colonies—but Great Britain was not as powerful in the days of King George as is the United States today.

DR. BRANNER HELD IN HIGH ESTEEM

Few university teachers or presidents have left a stronger personal impression on their students or have gained such thorough respect from their students than has Dr. J. C. Branner, recently of Stanford, who was the guest of honor here last month at a reception given by the Alumni of Stanford in Washington. His resignation from the presidency of that university was accepted only when he had remained a year after he had asked to be relieved from duty, and then only upon his insistence that it should be accepted.

He is succeeded as head of the Depart of Geology by Dr. Bailey Willis, formerly of the United States Geological Survey, and as president of the university by Dr. Ray L. Wilbur, an alumnus of Stanford, who has been head of the Medical School, both of whom are very able men.

SAFETY-FIRST WEEK A GREAT SUCCESS

Safety-first week proved a great success. The exhibition held in Washington under Government auspices has done much to encourage and spread the movement. The mining industry, of course, was the pivot of interest around which the rest revolved. The idea originated in the Bureau of Mines.

The gathering of the mine inspectors from practically every State in the Union has had splendid results. It is certain to result in standardization and cooperation that has been lacking. The nation will profit by this convention and this exhibition.

In the February issue we urged that Safety-First Week be made a permanent proposition. This view has met with much favor. The chances are that each year's progress in safety-first work will be brought to the attention of the public through an exhibition. That the exhibits were of interest is indicated by the fact that 35,477 persons inspected them. While the publicity division of the Bureau of Mines did splendid work and secured more space than it would have been thought possible in this day of big news, yet the exposition was not systematically advertised. It was a sort of informal affair gotten up on short notice but even than it was a great success. It could have been much better and next year it probably will more nearly represent the work that the Government is doing to reduce fatalities and casualties.

The Bureau of Mines nationalized the slogan "safety-first." It is the originator of safety-first week, which will popularize still further the safety-first movement.

The American Mining Congress would like to make another suggestion. Why not load on a train the exhibits that were shown last month at the National Museum and haul them around the country and let more of the people see what the Government is doing in this work? This seems to us a practical proposition and we shall lose no opportunity of bringing it to the attention of those in authority.

EFFICIENCY AND CONSERVATION

The strength of a nation is fairly well measured by the use which it makes of its mineral products. The inventive genius of man in cooperation with capital by the consumption of coal has made it possible for one man's labor to accomplish more than one hundred men could have accomplished by primitive methods. By the utilization of these forces the luxuries of the past have become the necessities of today. Living conditions which were entirely beyond the reach of the crowned heads of a century ago are available for the working men of today.

The greater the efficiency in production, transportation and exchange the greater the luxuries which may be afforded by all of the people. The highest statesmanship is that which after providing stable government shall stimulate increased efficiency and make its advantage accrue to all of the people. Low-cost to the consumer requires efficient production and the prevention of waste.

The relation of labor and capital while subject to the laws of evolution, should adapt themselves with the least possible friction, to those conditions which promote efficiency and conservation.

DOES TRADE FOLLOW THE FLAG?

At no previous time in our history have so many comprehensive efforts been in progress by the business interests of America to control foreign trade. Particular efforts look to the control of the trade of Latin America. Under present conditions highly successful temporary results may be confidently expected. The benefits thus secured will not be permanent except through the highest efficiency of the productive forces of the country.

It seems evident that the close of the European war will be followed by a most strenuous competition. Impoverished Europe will face financial obligations requiring the utmost thrift and economy at home and the sale of its product in foreign markets. The cost of this product at home will be at the minimum and to meet the prices at which it will be offered in competitive markets will tax the ingenuity of American producers whose chief cost of production is based on the American wage scale. Much of the present effort is based upon the questionable premise that "Trade follows the flag."

Trade does not follow the flag unless supported by efficiency and pushed by enterprise. Demand is created by enterprise and filled by efficiency. The flag is the emblem of government representing order, without which trade comes to an end. The desire for gain—the business mainspring of the world—is ever seeking that point where articles of trade can be most cheaply purchased, and markets where they can be sold to the best advantage. Cheapness of production—efficiency—calls to itself the buyers of the world.

THE FEDERAL LEASING POLICY

In 1885 gold was discovered in the frozen stream beds of the Yukon. Its recovery required the using of a large amount of fuel. Wood fuel was comparatively scarce and expensive. Coal was abundant. No law of the United States provided for the utilization of Alaska's coal reserves. The appeals of Alaska induced Congress to undertake legislation to make her coal resources available. Laws were passed in 1900, 1904, 1908 and 1914 intended by Congress to meet the situation. Three of these laws have been abandoned as unworkable and the fourth has been in effect since August, 1914, but no coal has been mined under its provisions. Alaska's industries are contributing millions of dollars annually to the Nation's wealth and purchasing coal from Canada and oil from southern California. Her own oil and coal are locked up by the icy hand of ignorant control animated by the best impulses of a great and generous nation which has temporarily forgotten that the constitution of the United States was only made possible through the recognition, in a broad and comprehensive way, of the principles of home rule. That same nation inspired by the same theories and shutting its eyes to the foundation principle of the constitution, is now engaged in the enactment of similar laws for leasing the coal, oil and water power of the western States.

To the extent that these laws meet the demands of the theorists, who do not understand western conditions, will they be unworkable. Appeals and protests have been made to Congress by the West through the legislatures of the several States, through its Chambers of Commerce and its various public organizations.

It seems probable that the leasing bills will be enacted by the present session of Congress. It seems equally probable that future years will demonstrate the impracticability of the leasing policy as applied to the development of resources situated more than 2,000 miles from the seat of Government.

BETTER JUDGMENT SHOWN BY CONGRESS

Abundant evidence of more than the usual judgment in appropriating is being displayed by this Congress. In allowing $100,000 to the Geological Survey in the urgent deficiency bill for preliminary expenses for Alaskan work it has made possible an economic and efficient use of the appropriation. It enables the Survey to perfect its plans in time to get supplies into the interior before the spring break-up.

SAFETY-FIRST EXHIBITION PRAISED BY PRESIDENT

(Continued from page 112)

different from the iron mines in Michigan; and on the other hand some of the methods adopted in Michigan have been adopted in some of the precious metal mining in the West. The method of mining is the important factor. The best you can do is an approximation."

TAKES EXCEPTION

Mr. Donovan then declared:

"It appears to me that the main object of this meeting is to discuss the saving of human lives and not the insurance rate that we are going to charge them. What we want to do is to save a man's life so that he can be of some service to his community. With all due regard to your insurance rate, we want to keep these miners at work, because after all it is a question of how that man can with safety to himself and to others get that pound of coal up without killing himself or somebody else. We should keep in mind the main point at issue and that is when a good looking miner goes underground you want him to look just as good when he comes out. As I have stated before, if we have one or two more years of the war, one of those miners will be worth six or seven dollars a day because we will have a hard time finding men enough to operate our mines. The element of life is the one for us to talk about."

Mr. Wilson takes a very different view of this question and said in reply:

"I do not think that the last speaker intends to convey the implication which he does convey, because he knows too much about insurance. We are all after the very thing which he is speaking about, the conservation of life. He knows that insurance companies are interested financially in saving life, so that is too trite to discuss. It is naturally unnecessary that each of us discuss a subject like this from the standpoint of our own individual business. The Chairman made the suggestion just now that we do not want to lay down any rules and that we should have a discussion which may result in reference of these subjects to a committee. I think that last suggestion an admirable one. There is no question, however, that we should debate rather freely or we will not have anything for that committee to consider. I make the suggestion, therefore, that at an appropriate time a resolution be brought forward authorizing the chairman to appoint a committee consisting of the various interests concerned in saving lives in mines to consider and pass upon the acts of this meeting and embody its subsequent resolutions in the report. Meantime, however, and for the guidance of that committee, I believe that it would be well for us so far as we can to follow the course which Mr. Fay outlined."

QUESTION OF ACCURACY

With regard to securing greater accuracy in statistics an interesting discussion resulted. Mr. Fay introduced the matter as follows:

"The matter of reporting the number of men employed is far from uniform and is far from accurate. The number of men reported employed are entirely too large. It is an easy matter to run over the payrolls and say that 25 men were on the payroll this month, but all the men did not work full time. On the forms which we are sending out now, collecting information for year 1915 the question has been inserted asking for the number of hours of labor for which wages were paid as shown by the payrolls. In other words, they should turn in to us, if they are employing 1,000 men for 8 hours a day, 8,000 hours a day. They know exactly how many shifts they have paid for and how many hours a man has worked. Many companies have records to show the number of hours for which they have paid wages. If they will give us this information these columns (showing number of 8, 9 and 10 hour shifts, and men so employed) here are not necessary. This is another way of getting at approximately the number of hours that the men were working and it is better than simply calling for the number of men employed."

COLORADO PRACTICE

Mr. Dalrymple, of Colorado, said: "We get out a bulletin in Colorado along these lines. Every month the operators report. We get the number of days worked by each man, the number of men employed and the number of tons produced. We carry on the totals to the end of the year and then divide it by twelve. I think this is as accurate as you can get it. During the summer months and spring months they very seldom work more than four hours a day hoisting coal. As to whether the company reports the number of days or the number of hours for an 8-hour day that has been working in hoisting, whether they give the number of hours that have been worked by the miner I am not in a position to say. I can say, however, that no matter how you get this record it will be approximate at best.

Mr. Hall, of Pennsylvania, said:

"A peculiar condition exists in Pennsylvania. Two miners may work together. Their business is to blast down coal. They divide the day pay. The two men go into the mine in the morning and one man may work for an hour blasting coal, but each gets the same pay. One man may get a day's pay for a half-hour's work."

Mr. Bohlander, of Illinois, said:

"I wish to say that, as far as Illinios is concerned in coal mining, the hour basis would be almost an impossibility. We pay so much per ton. The men work when they please; they go in when they please and come out when they please. The mines have a number of openings and if you wanted to get the correct time you would have to have a steel trap at every opening. We have an eight-hour law but very few of the men work the full eight hours."

J. W. Paul, who is very familiar with conditions in West Virginia, said:

"With a view of determining whether or not the nationality and prior experience of men of foreign birth who worked in the mines and their lack of knowledge of the English language have anything to do with the percentage of accidents in mines, we adopted a table. It does not seem to have been very uniformly followed up by the other State inspection departments. Had this been done there might be made some comparison in the different States. I believe Pennsylvania has taken up a similar classification in recent years. We have frequently heard in public speeches and from persons making efforts to have legislation adopted, the statement that the large number of accidents is due to the fact that the foreigner who works in our mines cannot speak the English language.

"I doubt very much if this is as true as some people seem to think it is. This table was suggested with the view of securing data which would be of service in the formulating of additional rules and regulations and the securing of legislation. West Virginia has been carrying this table along from year to year. I think, however, it would be well for some committee to take this and revise the classification of the nationality of employes. I think that these names were adopted and copies largely from the reports sent in by the operators in which the proper classification of the nationalities from the various countries have not been fully complied with."

In this connection Mr. Atkinson said:

"For a number of years I was in the mine inspection service in West Virginia. I know how hard it was in the early days to get any information from the operators. I also am perfectly familiar with the fact that Mr. Paul (and I say this with all respect to his predecessor) was the first man who attempted to put the mine inspection work of West Virginia on any real business basis. In regard to nationalities. It has always been a question with me as to whether the ignorant foreigner is always the one who gets hurt. In my experience, which has been practically limited, I find that the experienced miner will take more chances and will do more foolhardy things than any other man that we have around the mine. An ignorant and green foreigner goes into the mine with an experienced foreigner who takes good care of him. So far as the tables are concerned I know that Mr. Fay is more familiar with them than most any person you could possibly get."

FOREMEN DISCRIMINATE

T. P. Wangler said:

"I do not know how many times I have walked into a room with the mine foreman or into an entry without noticing that when he would speak to an English-speaking man, he spoke to him in a very respectful sort of way. But if he would encounter a foreigner of any one of the Slavic race, for instance, his tone and manner would completely change, so much that I was struck. Many times I felt that he was not giving the foreigner the right kind of deal. I have actually seen, many, many times, a foreman miner leave an English-speaking miner working under a distinct hazard for the simple reason that he was timid about asking him to take precautions. All through West Virginia, the average English-speaking miner will give you a cussing out if you say too much to him about setting up a post, etc. I at one time went into a colliery in the middle west following up a mine explosion which had occurred some years before. I inquired of one of the miners about the cause of it. 'Well,' the fellow said, 'the cause of it was simply this. In this gangway we had about 12 men working. There were two brothers, English speaking, and the others were all foreigners. One of the brothers in carrying his timber up the breast became angered and aggrevated because he had to use a small Davy safety lamp. He hurt himself in some way or other, and in his anger broke the safety lamp over the timber, igniting the gas and killing eleven men. His brother was the only one saved.' The point is that the foreigner in a coal mine is obedient. He will listen to his superior, but the American thinks he is smarter than the other fellow and he will not listen.

RESOLUTIONS

Resolutions were adopted as follows:

1. The Committee recommends the acceptance of Form 7 (Form for reporting total number of men employed and of accidents in the mineral industry during a calendar year), as printed except that distinction should be made between the various kinds of metal mines, as copper, iron, lead and zinc, gold and silver, and between anthracite and bituminous mines. In the case of quarries, distinction should be made between the principal building stones, such as bluestone, granite, marble, sandstone, etc.

2. That the Committee recommends the adoption of Forms Nos. 8 (Form for reporting fatalities during a calendar year inside and outside of the coal mines, metal mines, and quarries), and 9 (Form for reporting nonfatal injuries during a calendar year at coal mines, metal mines, and quarries), with the addition of one column to show whether or not the injured person could understand English, and that the last column marked, "inside or outside," be replaced with the words, "where the accident occurred."

3. That the Committee recommends that Forms Nos. 10 (Form for reporting number of men employed inside and outside of coal mines, by occupation), and 11 (Form for reporting coal mine fatalities according to cause and occupation), be adopted with the addition of a column in each table showing the additional occupation, namely, "shot firer." That in Table 10, the columns relating to the "length of shift" be omitted, inasmuch as it seems apparent that reliable information of this character will be difficult to obtain.

4. That the Committee recommends that Forms 12 (Form for reporting number and class of all employes inside and outside of all mines except coal mines), and 13 (Form for reporting metal mine fatalities according to cause and occupation), be adopted, except that in Form 12, the columns relating to the number of hours worked per day be omitted.

5. That the Committee recommends that Form 14 (Form for reporting fatalities in or about coal or metal mines, quarries, and metal-

lurgical plants according to length of experience of injured employes), be omitted, inasmuch, as it will be difficult, if not impossible, to secure reliable information relating thereto. Data showing whether or not the injured person can understand English will be given in Tables Nos. 8 and 9.

6. That the Committee recommends that the definition of a fatal accident be that which terminates in death as a result of the injury regardless of time elapsed.

7. That the Committee recommends the adoption of Forms Nos. 1 (Form for a State directory of mines), and 2 (Form for reporting power equipment of mines, quarries, and metallurgical plants), as printed. That form 1 include one column showing dip of bed.

8. That the Committee recommends the adoption of Forms Nos. 4 (Form for reporting number and kind of mining machines in coal mines, kind and quantity of explosives used, and quantity of coal produced by various kinds of mining), and 5 (Form for reporting mining and ventilating equipment and explosives used in metal mines, with the exception that under Form 5, kind of opening be shown as shaft and tunnel with depth or length.

9. That the Committee recommends that Form No. 3 (Form for reporting ventilating equipment of coal mines), be referred again to the convention for general discussion.

10. The Committee on Resolutions recommends that the question of determining the number of men actually employed be given consideration by the final committee. Further, that it being almost impossible to secure data relating to the number of hours worked, that the number of men employed be based upon the total actual man shifts for which wages were paid during the year, or as an alternative that an average obtained from the pay rolls showing the actual number of men at work on a certain day each month throughout the year be taken as representing the number employed. That accident rates be calculated on a basis of 300 day workers.

11. That the Committee recommends that a committee of 7 be appointed to consider the foregoing resolutions in conjunction with the stenographic report of this conference, and be instructed to prepare for publication the proceedings of this meeting. This committee is to consist of 2 representatives of the coal mining industry, 2 representatives of the metal mining industry, 2 representatives of State compensation commissions, and one representative from the Bureau of Mines.

LIST OF DELEGATES

Delegates attending the conference of mine inspectors and representatives of industrial accident commissions were: J. T. Beard, Associate Editor, *Coal Age*, New York; Robt. N. Bell, State Mine Inspector, Boise, Idaho; John Bohlander, President, State Mining Board, Pekin, Ill.; G. H. Bolin, State Mine Inspector, Phoenix, Ariz.; Ed. Boyle, Chief Inspector of Mines, McAlester, Okla.; J. F. Callbreath; W. L. Chandler, National Safety Council, Mishawaka, Ind.; F. S. Crum, Prudential Insurance Co., Newark, N. J.; Jas. Dalrymple, State Coal Mine Inspector, Denver, Colo.; Thos. H. Devlin, Chairman, Illinois Mine Rescue Commission, Assumption, Ill.; A. W. Donovan, Chairman, Massachusetts State Board of Labor and Industry, No. 1 Beacon Street, Boston, Mass.; Otto Ellerman, State Mine Inspector, Lead, S. D.; Chas. Enzian, Mining Engineer, Philadelphia & Reading Coal and Iron Co., Pottsville, Pa.; Albert H. Fay, Mining Engineer, Washington, D. C.; Frank Hall, Deputy Chief, State Department of Mines, Harrisburg, Pa.; R. Dawson Hall, Associate Editor, *Coal Age*, New York, N. Y.; L. W. Hatch, Chief Statistician, New York State Industrial Commission, Albany, N. Y.; L. M. Jones, Mining Engineer, Pittsburgh, Pa.; W. W. Jones, Chief Mine Inspector, Albany, N. Y.; P. J. McBride, Bureau of Chemistry, Topeka, Kan.; H. D. McCaskey, Geological Survey, Washington, D. C.; Wm. Maloney, Territorial Mine Inspector, Nome, Alaska; Van. H. Manning, Director, Bureau of Mines, Washington, D. C.; G. F. Mickelbacher, Workmen's Compensation Service Bureau, White Plains, N. Y.; A. Munson, Dover, N. J.; W. B. Orem, State Metal-Mine Inspector, Helena, Mont.; J. W. Paul, Mine Inspectors Institute, Pittsburgh, Pa.; J. E. Pettit, State Coal-Mine Inspector, Salt Lake City; D. J. Price, Bureau of Chemistry, Washington, D. C.; R. T. Rhys, Coal Mine Inspector, District No. 2, Ottumwa, Iowa; Geo. S. Rice, Chief Mining Engineer, Washington, D. C.; W. W. Risdon, State Mine Inspector, Albuquerque, N. M.; I. M. Rubinow, Chief Statistician, Ocean Accident and Guarantee Corp., Ltd., New York, N. Y.; J. J. Rutledge, Mining Engineer, McAlester, Okla.; W. D. Ryan, Mine Safety Commissioner, Kansas City; M. L. Shipman, Commissioner, Labor & Printing, Raleigh, N. C.; Geo. O. Smith, Director, United States Geological Survey, Washington, D. C.; Sumner S. Smith, United States Mine Inspector for Alaska, Juneau, Alaska; Ex-Lieut. Gov. A. E. Spriggs, Chairman, State Industrial Accident Board, Helena, Mont.; Ed. Sweeney, Coal Mine Inspector, District No. 3, Des Moines, Iowa; W. H. Tolman, Director, American Museum of Safety, New York, N. Y.; C. H. Verrill, Bureau of Labor Statistics, Washington, D. C.; Thos. P. Wangler, Travelers Insurance Co., Columbus, Ohio, H. M. Wilson, Director, Department of Inspection and Safety Associated Companies, Pittsburgh, Pa.; H. M. Wolflin Industrial Accident Board of California, San Francisco.

* * *

Current Traffic Developments

In the important case of the Mitchell Coal & Coke Company *vs.* Pennsylvania Railroad Company, the Interstate Commerce Commission held:

1. The service over private tracks from the mines and coke ovens of shippers to the rails of the carrier is neither compelled nor prohibited by statute or at common law; but whichever course the carrier pursues the statutory inhibition of unjust discrimination and unreasonable preference or advantage must be observed.
2. When the carrier employs a shipper to perform this service for it, if the compensation is excessive, the shipper obtains an unreasonable preference and advantage in violation of the regulation statute.
3. The allowance paid by the defendant here to the competitors of the complainant was unreasonable and unlawful to the extent that it exceeded 8 cents per ton.

The Mitchell Coal & Coke Company, here complainant, owned and operated several mines and collieries on the line of the defendant in the Clearfield district. Its Gallitzin colliery, the one directly involved in this proceeding, was located approximately one mile from the main line of the defendant. Although the practice of paying allowances to shippers for services performed by them, between their operations and the defendant carrier's rails, was in effect prior to the year 1890, it is alleged that the officers of the complainant had no knowledge of that fact until 1898. Before the period of the action and until 1899 the defendant carrier moved the coals of the complainant from the Gallitzin colliery to its main line. Being informed that competing coal companies were performing the service for themselves and were receiving from the defendant carrier 10 cents per ton therefor, the complainant, in October, 1899, and for the sole purpose of receiving a similar allowance, installed a locomotive at its Gallitzin mine, and thereafter continued to perform all the service incident to moving the loaded and empty cars between its mine and the main line junction. The defendant, however, declined to pay allowances on the ground that it was itself prepared to perform the service, although, because of operating conditions, it could not do so economically at the Altoona, Glen White, and Milwood mines. An offer by the complainant to perform the service for 5 cents per ton was likewise declined, the evidence showed.

Dismiss Reeves' Complaint

In the case of the Reeves Coal Company *vs.* Chicago, Milwaukee & St Paul Railway Company in which the defendant failed properly to advise complainant as to the route traversed by coal from Roosevelt, Tenn., to Dell Rapids, S. Dak., and defendant's subsequent failure strictly to observe the terms of complainant's reconsigning order, the Commission held it not to be a violation of the act to regulate commerce. The complaint was dismissed.

EFFECTS OF WAR ON MINERALS SUBJECT OF COMPARISON

Both metallic and nonmetallic minerals and both crude and manufactured products, exports and imports are affected by the war. The exports of petroleum and petroleum products for 1914 were over $100,000,000, and those of the metals—iron, manganese, copper, zinc, lead, radium, and others—were correspondingly large.

On the other hand the imports, comprising potash salts, barytes, magnesite, ceramic materials, and many other mineral substances, derived mostly from the European countries now at war, are normally very large. With these supplies cut off or much reduced by the war, it is to the development of our domestic reserves or raw materials, heretofore chiefly obtained from foreign sources, that attention is being chiefly directed, in general with excellent prospects of permanent economic and commercial benefit. For instance, since the outbreak of the war the demand for certain metals for making munitions has greatly raised the prices of those metals with the result that many deposits of these metals hitherto dormant have become active producers. For example, the price of antimony has advanced from 6 cents to more than 40 cents per pound, that of mercury from $40 to $200 or more per flask, that of platinum from $37 to $100 or more per ounce, and that of tungsten ores from $6 to $60 or more per unit (20 pounds of tungsten trioxide.) The same is true of the prices of other commodities. For example, the price of sulphuric acid, which substance is also used in making munitions, has advanced to a higher point than ever before in history.

These comparisons were made recently by F. C. Schrader, of the U. S. Geological Survey.

C. WILLARD HAYES, GEOLOGIST, DIES IN WASHINGTON

C. Willard Hayes, one of the best known geologists of the United States, died in Washington, February 8, a victim of cancer.

He was chief geologist of the United States Geological Survey from 1907 to 1911. He resigned to accept a position with the Aguila Oil Company, of Mexico. Much of the time since he left the Survey has been spent in the Tampico oil fields.

Recent Legal Decisions

IOWA COMPENSATION ACT

The workmen's compensation act of Iowa (Acts of 35th General Assembly, Chap. 147) takes from the employer, if he accepts the provisions of the act, the following defenses: (1) That the employe assumed the risks inherent in, or incident to, or arising out of the employment; (2) that the employer assumed the risks arising from the failure of the employer to provide and maintain a reasonably safe place for the employe to work; (3) that the employe assumed the risks arising from the failure of the employer to furnish reasonably safe tools and appliances; (4) that the employer exercised reasonable care in selecting reasonably competent employes; and (5) that the injury was caused by the negligence of a fellow servant or co-employe.

Hunter *vs.* Colfax Consolidated Coal Co. (Iowa), 154 Northwestern, 1037, p. 1040, November, 1915.

DEFENSES AVAILABLE TO EMPLOYER

The provision of the Iowa workmen's compensation act to the affect that wilful negligence of an employe, with intent to cause his own injury, or negligence on his part due to intoxication, remain defenses, deals with cases where both master and servant are or may be in varying degrees to blame and limits the defense that the employer is not liable because the employe contributed to his own injury, to contribution by wilful self-infliction or by negligence due to drunkenness; but the fact that the two specified acts of negligence on the part of the employe remain a defense does not prevent an employer from showing that, whoever else was to blame or whoever contributed, or whatever the mental attitude or condition of the contributor may have been, the employer himself was in no manner to blame. Such a provision settles how far the negligence of the employee remains available as a defense, but does not touch the question whether the freedom of the employer from all blame remains a defense.

Hunter *vs.* Colfax Consolidated Coal Co. (Iowa), 154 Northwestern, 1037, p. 1041, November, 1915.

EFFECT ON RIGHT TO CONTRACT

The Iowa workmen's compensation act as applied to mining and other corporations prohibits any contract, rule or regulation that shall operate to relieve an employer from any liability created by the act, except as the act itself provides; and it makes any device by which the employe is to pay an insurance premium against the compensation provided in the act null and void, and permits no wages to be withheld for the purpose of paying premiums, and prevents an employe from waiving any provisions of the act if the statutory compensation is thereby lessened. But another section provides that the fixed amount of compensation cannot be reduced by contribution from employes. These are, however, in essence, guards against contracts to reduce liability for negligence and instead of being an invasion of the right of contract, they are precautions against allowing an employer to first accept the act and then avoid it by subterfuge, and thus what is taken away is not the right to bargain, but the right, by deviousness, to break the bargain made, and aside from this the right to contract is not infringed by the provisions aimed to insure compliance with contracts entered into.

Hunter *vs.* Colfax Consolidated Coal Co. (Iowa), 154 Northwestern, 1037, p. 1049, November, 1915.

CONTRIBUTORY NEGLIGENCE

In an action under the Iowa workmen's compensation act by a miner for injuries alleged to have resulted from the negligence of the mine operator, the mine operator may plead and prove contributory negligence of the injured miner by way of mitigation of damages.

Hunter *vs.* Colfax Consolidated Coal Co. (Iowa), 154 Northwestern, 1037, p. 1069, November, 1915.

RIGHT TO DEFEND

The Iowa workmen's compensation act does not prevent a coal mine operator, in an action against it by a miner for injuries due to the alleged negligence of the operator, from defending on the ground that the operator was in no wise at fault for the alleged injury charged to it.

Hunter *vs.* Colfax Consolidated Coal Co. (Iowa), 154 Northwestern, 1037, p. 1069, November, 1915.

INDUCING MINER TO REJECT BENEFIT OF STATUTE—EFFECT

Section 3 of the Iowa workmen's compensation act provides that if by or on behalf of the employer any request, suggestion, or demand was made that an employe, or a person seeking employment, shall exercise his right to reject the act, there shall arise a conclusive presumption that such employe or applicant was unduly influenced to exercise this right and that the rejection made under such circumstances shall be conclusively presumed to have been procured through fraud and be null and void.

Hunter *vs.* Colfax Consolidated Coal Co. (Iowa), 154 Northwestern, 1037, p. 1050, November, 1915.

CONSTITUTIONALITY OF STATUTE

A mining corporation is not a "citizen" within the protection of the "privileges and immunities'" provisions of the federal constitution, and such a corporation cannot question the constitutionality of a workmen's compensation act on the ground that it effects a wrongful breachment of the privileges and immunities of citizenship.

Hunter *vs.* Colfax Consolidated Coal Co. (Iowa), 154 Northwestern, 1037, p. 1067, November, 1915.

DEFENSE ABOLISHED

It is within the power of a legislature to eliminate by statute the various defenses resting risks assumed by an employe on the ground that these rules have been evolved by the courts and may properly be abrogated by the legislature.

Hunter *vs.* Colfax Consolidated Coal Co. (Iowa), 154 Northwestern, 1037, p. 1066, November, 1915.

MINERS' COMPENSATION ACT

A law known as a miners' compensation act is held valid though it provides a summary method for the disposition of claims filed under the law, and such an act is not unconstitutional as conferring judicial power on the State officer having charge and oversight of its administration.

Hunter *vs.* Colfax Consolidated Coal Co. (Iowa), 154 Northwestern, 1037, p. 1061, November, 1915.

See Cunningham *vs.* Northwestern Improvement Co., 44 Montana, 180, 119, Pacific, 554.

CLASSIFICATION AS TO MINING

The workmen's compensation act of Iowa is not unconstitutional on the ground of class legislation and because it applies to coal mining and excepts from its operation domestic servants, farm or other laborers engaged in agricultural pursuits, and persons whose employment is of a casual nature, and those engaged in clerical labor, as the differentiation between coal mining, and some or all of such excepted persons, is not arbitrary but natural and justified, and strict equality is neither necessary nor practically obtainable; and accordingly the act is not subject to the charge of class legislation.

Hunter *vs.* Colfax Consolidated Coal Co. (Iowa), 154 Northwestern, 1037, p. 1052, November, 1915.

REGULATING COAL MINING

The legislature of a State has power to pass laws regulating an extra hazardous business, such as coal mining, and to provide for benefits in case of injury or death, upon the ground that it involves an intention to reduce economic waste, to obviate breaches and dissensions between employers and employes, raise the standard of citizenship, lower the general burden of taxation, to promote peace, order and morals, as well as upon the ground that such an act is the proper exercise of the police power.

Hunter *vs.* Colfax Consolidated Coal Co. (Iowa), 154 Northwestern, 1037, p. 1051, November, 1915.

See Cunningham *vs.* Northwestern Improvement Co., 44 Montana, 180, 119, Pacific, 554.

LIMITING POWER TO CONTRACT

A statute preventing miners employed at quantity rates from contracting for wages upon the basis of screened coal, instead of the weight of the coal as originally produced in the mine, is not invalid and unconstitutional because it limits or deprives persons of the right to contract.

Hunter *vs.* Colfax Consolidated Coal Co. (Iowa), 154 Northwestern, 1037, p. 1051, November, 1915.

RIGHT TO QUESTION VALIDITY

An attack upon the constitutionality of the Iowa workmen's compensation law by a mine operator will not be justified or permitted on the ground that it may be so construed as to invade private rights secured by the constitution, unless such mining corporation shows that in the case it presents the effect of applying the statute is to deprive it of a constitutional right. But if acceptance of the act is elective then the claim of its invading constitutional rights will fail.

Hunter *vs.* Colfax Consolidated Coal Co. (Iowa), 154 Northwestern, 1037, p. 1048, November, 1915.

In an action against a coal mine operator for the death of a miner caused by the fall of rock from the roof of the mine, it becomes a question of fact to be determined by the jury trying the case whether the proximate cause of the miner's death was due to the negligence of the mine operator or whether the mine was operated by an independent contractor, and for whose negligence the mine operator was not responsible, where the evidence shows a written lease from the mine owner by which the mine was leased to a third person named to be operated by him, but where the evidence shows also that the mine operator issued checks to the miners in his own name in payment for labor and that such checks were good in the purchase of merchandise at the commissaries of the mine operator and that the mine operator deducted from the miners' wages certain insurance premiums as shown by the records of the timekeeper of the mine operator, and that the checks for time and wages were turned in at the office of the mine operator and the money was paid thereon by the operator, and that the mine was in fact owned by the defendant operator, and that the mules and cars used for hauling coal belonged to the operator and that the alleged lessee had before that time been employed by and worked for the mine operator, though at the time of the alleged injury he had an office next to the office of the mine operator, where the time of the miners was turned in and kept, and that the miners went directly from such office to that of the mine operator and got checks in payment for time employed or labor performed.

Amerson *vs.* Corona Coal & Iron Co. (Alabama), 69 Southern, 601; June, 1915.

PRESUMPTION AS TO NEGLIGENCE

The workmen's compensation act of Iowa provides that in case of injury to an employee it shall be presumed: (1) That the injury was the direct result and grew out of the negligence of the employer; (2) that such negligence was the proximate cause of the injury, and in such case the burden of proof shall rest upon the employer to rebut the presumption of negligence. But this does not deprive the employer of the right to show he was wholly free from blame, but does cast upon him the affirmative of showing that he is blameless and in effect says that the employe need not prove the employer was at fault, but the latter must show that he was free from fault.

Hunter *vs.* Colfax Consolidated Coal Co. (Iowa), 154 Northwestern, 1037, p. 1041, November, 1915.

Proceedings Being Distributed

During the past month the Bureau of Mines has distributed 8,000 copies of the proceedings of the Mining and Metallurgical Society of America meeting, which was held at Washington, December 16. This meeting was called mainly to urge upon Congress the necessity of revision the mining laws.

Director Smith Oil Land Witness

George Otis Smith, director of the Geological Survey, at the Senate lands committee's hearing on proposed relief for California and Wyoming oil operators who entered public lands withdrawn from entry by the Taft proclamation of 1909, testified that his understanding of the desire of the Government in 1909 and 1910 was that the rights and equities of these entrymen should be protected.

Prof. G. H. Clevenger, professor of metallurgy at Stanford University, stopped off in Salt Lake City en route to Stanford, after a month's trip in the East, during which time he attended the sessions of the Pan-American Scientific Congress held in Washington, December 27 to January 8. Prof. Clevenger is also a member of the United States Bureau of Mines, being a consulting metallurgical engineer. While in Salt Lake City he conferred with D. A. Lyon, in charge of the Salt Lake station of the bureau, and looked over the work being done by the Department of Metallurgical Research of the University of Utah, in flotation and other problems, in cooperation with the Bureau of Mines.

ALASKA MAKES FIRST SHIPMENT OF PYRITES

The boom in the pyrites industry in West Virginia and Tennessee continues to grow. The demand for barium chemicals continues strong and is increasing decidely. While it is known that they are being used for war purposes, no one of the Government's experts in Washingron seems to be able to explain for just what purpose they are being used.

Alaska has made its first shipment of pyrites and Colorado and Nevada probably soon will begin shipping, despite the high freight rates against which they must contend.

ARIZONA INCREASES OUTPUT OF HIGH-GRADE ASBESTOS

Never before has the United States produced asbestos in so large an amount and of such high grade as in 1915. The Arizona asbestos is of very high grade and is of special value on account of its low content of iron. This makes it particularly adaptable for use in electrical insulation.

The country has been producing its usual amount of low grade asbestos, but the great mass used by American manufacturers—which incidentally are the largest in the world—comes from Canada.

INVESTIGATING GREEN SANDS AS POSSIBLE POTASH SOURCE

In its effort to develop a commercial supply of potash in the United States, the United States Geological Survey is making an investigation of the green sands in several states with a view to making public more comprehensive as well as more authentic information regarding both the extent of these deposits and their potash content. The results of the investigations probably will be placed before chemical engineers as soon as information of merit is available.

The great extent of green sands and the ease with which it is mined, as well as its extensive distribution and proximity to large agricultural regions would make the project of extracting potash in commercial values of great importance to the nation.

RADIUM WORTH $50,000 DELIVERED IN FEBRUARY

Fifty thousand dollars worth of radium was sent to the Bureau of Mines here on the February 1 delivery from Denver. The actual quantity was 421.6 milligrams. This is the largest single delivery which has been made since the Bureau of Mines undertook radium work in Colorado. The total amount of radium which has been delivered to date is three and one-half grams. More than six grams however, have been extracted and will be delivered in course of time. The present market price for radium is $120,000 per gram.

WAR HAS LITTLE EFFECT ON PRICES OF GRAPHITE

Mexican Production Continues in Same Volume Despite Revolutions—Some Ceylon Graphite Reaching U. S.

Little change in the price of graphite has been caused by the war. An interesting report on graphite, written by Edson S. Bastin, has just been published by the U. S. Geological Survey. Some extracts from it follow:

"The form of carbon known as graphite or plumbago occurs in nature in a variety of ways and serves a great many useful purposes, chief among which are its uses in the manufacture of crucibles and other refractory products, as lubricants, for foundry facings, as stove polishes, etc. Its properties, origin and uses and its mode of occurrence at the principal localities of the United States have been fully described in the report on graphite in Mineral Resources for 1913, which will be sent free on request made to the Director, United States Geological Survey, Washington, D. C. That report also contains a bibliography of the more important publications dealing with the general character of graphite and its occurrence in this country.

"The events of the most importance in the graphite industry during 1914 were in the main the effects direct or indirect of the European war.

"Attention may be directed especially to the fact that the imports of graphite from Mexico nearly equaled those for 1913 in spite of the turbulent conditions in that republic. The imports of Korean graphite were about half again as large in 1914 as in 1913, increasing from 4,170 to 6,327 tons. The importation from Ceylon, on the other hand, was about half that for 1913.

"The two uses of graphite that seem to have shown the greatest gains during the year are its application to automobile lubrication and its use as a preparation to loosen boiler 'scale.' The effect of the graphite in the boilers is mechanical, not chemical. Being chemically inert, it cannot injure the iron of the boilers or affect the quality of the boiler water. It does not prevent the formation of scale, but the fine graphite particles by mixing with the scale during its formation render it soft and crumbly and prevent it from adhering strongly to the boiler. It can then be easily removed. It is said, moreover, that graphite is efficient in loosening old scale, the graphite particles working into the pores of the scale and between the scale and the boiler.

"In October, 1913, patents were applied for in Austria and Germany by the Allenzer Grafit und Talkstein Werkschaft, with office in Vienna and plant at Allenz (Steiermark), covering the use of graphite as a coloring material and filler in the manufacture of gray to black paper, pasteboard, and textiles. The process, which is especially designed for paper and pasteboard manufacture, consists in incorporating in the goods powdered graphite which may be added dry or as a fine slime. The graphite is said to be superior to gray mineral or chemical coloring matter hitherto used, in that the color does not fade in prolonged exposure to sunlight. Streaked and spotted defects, it is claimed, are less likely to appear during the process of making the paper. The opening of a new 'flake' graphite property, three miles north of Ashland, Ala., by the Jennings Graphite Co., is noteworthy.

PRODUCTION

"As usual, the greater part of the crystalline graphite was produced by New York, Pennsylvania, and Alabama. The production of these States was all of the variety known in the trade as 'flake' graphite that occurs as small flakes forming 5 to 10 per cent by weight, of crystalline schists, from which it is separated by more or less complicated milling processes. In addition to this, a small quantity of crystalline graphite, resembling in a general way the Ceylon graphite, was produced in Montana. The total production of crystalline graphite showed, as a result of increased production in Alabama, a slight increase, both in quantity and in value, as compared with 1913. The number of producing firms was seven in all, three in Alabama, one in Montana, two in New York and one in Pennsylvania.

"Amorphous graphite was produced by three firms, and the production was considerably below that for 1913. All of this material was of low grade, suited for paint pigment and foundry facings.

"Graphite in large quantities is manufactured by the International Acheson Graphite Co., at Niagara Falls, N. Y., which utilizes electric power generated at the Falls.

MARKETS AND PRICES

"The high prices of Ceylon graphite reached in the latter part of 1913 were maintained in the early part of 1914, but began to decline in May and June, owing to the general business depression in the United States. The decline continued until the outbreak of the European war in August, after which prices remained fairly constant until the close of the year. The prices prevailing from August to December, 1914, were from 25 to 40 per cent lower than those that prevailed in the latter part of 1913 and the early part of 1914.

"With the outbreak of the war the Ceylon graphite trade was greatly disturbed. The German markets, which in 1913 absorbed over one-fifth of the total output, were suddenly closed. This did not, however, lead to any decrease in the price of graphite in the United States, for freight rates at the same time increased, war insurance became necessary, and a German line of steamers that brought Ceylon graphite to this country ceased to operate. The increase in freight rates was due not only to the decreased number of vessels available but to the commandeering of coal at the usual coaling ports for military purposes, thus necessitating heavy coaling at the beginning of the voyage and proportionately reducing the space for cargo. Moreover, a large number of graphite mines in Ceylon had closed even before the outbreak of the war because of a shortage in labor due to the bubonic plague and because of the flooding of mines by unusually heavy rains. According to one of the large importers, not over 25 per cent of the mines operated in 1913 were in operation at the close of 1914.

"The net result of these conditions was that the prices of Ceylon graphite in the United States during August, September and October remained at about the same level as just before the outbreak of the war.

"On October 22 the governor of the Island of Ceylon proclaimed an embargo on plumbago to all ports except British ports, and from that date until the close of the year practically no Ceylon graphite was brought into the United States. Fortunately the principal American dealers had fairly large reserve stocks, so that there was no serious shortage during November and December. Since the close of 1914 trade has adjusted itself to the changed conditions, and Ceylon graphite is now coming into this country under certain restrictions by way of London.

"Madagascar graphite continued to be imported in considerable quantity until the latter part of the year, when an embargo similar to that on Ceylon graphite was imposed by the French government. Most of this graphite, which is of the 'flake' variety, requires cleaning after its arrival in this country. It sold for $100 to $150 a ton c.i.f. New York, according to grade.

"The price of crude Chosen (Korea) amorphous graphite during 1914 ranged from $22.50 to $25 a ton c.i.f. New York City. Most of this graphite commonly carries from 80 to 85 per cent of graphitic carbon.

"Refined Mexican amorphous graphite of lead-pencil grade sold in New York during the year at 4 to 8 cents a pound. For certain grades as high as 8 cents a pound was obtained.

"Most of the American firms that produced flake graphite in 1914 reported good markets for their product. This prosperous condition in spite of the general financial depression is attributable to the shortage of Ceylon graphite. The prices were extremely variable, but, as a rule, from 6 to 8 cents a pound f.o.b. cars was obtained for the better grades of finished crucible and lubricating flake. After the outbreak of the war as high as 10 cents a pound was obtained for a few carload lots."

Report Goes to Printer

The annual report of the Bureau of Mines showing in detail the coal mine fatalities in 1915, has gone to the printer. Albert H. Fay is the author of this report.

BUREAU OF MINES POINTS OUT ERROR IN MEASUREMENT

An unusually large number of inquiries are being received at the Bureau of Mines in connection with questions discussed by G. A. Burrell in technical paper number 131. Several startling revelations are made in this bulletin. The one which seems to have called for the most discussion is outlined as follows:

For years the natural-gas industry has accepted as true in measuring natural gas, a law discovered by Sir Robert Boyle in 1662, namely, that the product of the pressure and the volume of the gas is a constant at all pressures, or that the volume of a gas varies inversely as the pressure applied to it. This is not strictly true, and neglect of the error has resulted in enormous miscalculations in natural-gas measurements. The law may be accepted as true only for pressures close to atmospheric. It so happens that billions of cubic feet of natural gas are yearly measured at pressures greater than atmospheric. Pressures of 300 pounds per square inch or greater are common. At 100 pounds per square inch an error of 3 per cent has been made, at 200 pounds per square inch an error of 6 per cent, at 375 pounds an error of 11 per cent, and at 520 pounds an error of 15 per cent has been made in may cases. Natural gas at these pressures is more compressible than an ideal gas (for which Boyle's law holds). A concrete example will make the matter clear. If 50,000,000 cubic feet of natural gas is measured per day at a pressure of 200 pounds per square inch and no correction is applied for the deviation from Boyle's law, then an error of about 3,000,000 cubic feet of gas is made. Instead of the measured amount being 50,000,000 cubic feet of gas per day, as supposed, it is actually 3,000,000 cubic feet more.

FOLIO OF CASTLE ROCK AREA ISSUED BY GEOLOGICAL SURVEY

An important geological folio just has been published by the United States Geological Survey. It is the Castle Rock folio, covering a number of counties in the south-central portion of Colorado. This folio will be of great interest to the mining men of this region owing to the number of important mines in this area.

The Survey is making a geological atlas of the United States, which is being issued in parts, or folios. Each folio includes maps with descriptive text.

Owing to the importance of the Castle Rock region it has been made the subject of very detailed study. In addition to the maps and descriptive text, the folio is accompanied by twenty carefully selected photographs. There are also a number of figures showing sections of strata and characteristic rocks.

This is the one hundredth and ninety-eighth folio which has been issued toward making up the geological atlas.

HIGH PRICE OF PROSPECTS SHUTS OUT MUCH CAPITAL, SAYS AUTHORITY

Director of Arizona Bureau of Mines Discusses Difficulties Encountered in Sole of Unproven Mining Properties—Urges Move General Use of Assay Map

By Prof. C. F. Willis

Director Arizona Bureau of Mines

During the past few months, the Arizona State Bureau of Mines has had a great many inquiries from outside the State, desiring to purchase mines. At the same time, a great many more letters have come to the attention of the Bureau of Mines for sale within the State, but there has been a great difficulty in bringing the vendors and the vendees together satisfactorily. The trouble has been largely due to two things, the lack of knowledge as to where to sell a mine and the utter disregard of any basis of figuring on the value of the mine or prospect. A short time ago trouble was encountered, owing to the inability of the buyers to get either satisfactory terms or an option with the right to further examination.

In a discussion of this question there are several points to be taken up: First, where shall I go to sell my mine? Second, how shall I present my proposition to make it sufficiently attractive to warrant a further examination, and third, what value shall I place on the property?

A COMMON QUERY

Many letters are received by the Bureau on this one point—"Kindly give me the names of purchasers of zinc mines." "Kindly let me know the names of brokers who handle mining stock on a commission," and many such. Mines are not sold like real estate, and are not peddled about the streets in the eastern cities, as seems to be the impression of many of our correspondents.

There are companies that are making a business of the development of mineral property. The Guggenheim Exploration Co., the General Development Co., the Empire Zinc Co., and many others are constantly on the watch for mining properties of promise.

However, they do not sit back in their offices and wait for a fully developed property to be handed them at almost no cost, as seems to be the impression. These companies have scouts in the field constantly, their agents are constantly traveling the mining country on the lookout for prospects of promise; they have local offices in the West where properties are investigated.

The objections one hears to dealing with these houses are about as follows: "I have written them and failed to hear anything from them." "They expect the whole property at almost no cost." "They will not give me my price." "They want to purchase a control and will then freeze me out." These are but a few of the objections one hears when one of the larger syndicates is referred to. These large corporations have hundreds and even thousands of prospects called to their attention in the course of the year, and if you are one who has written to them and failed to receive a reply, it may be due to several reasons, but more probably it is due to the fact that you either did not present your case right or that your valuation was entirely out of the question. Had you presented your proposition in good form, undoubtedly they would have written further and taken the chance on adjusting the price. The question of how to present your case in good form is taken up later in this article.

It stands to reason that these development syndicates are not in business for their health and are no different from any one else in any other business. They are going to drive the best possible bargain. Every one wishes to drive the best bargain possible, and the seller is willing to take more than his property is worth if he can get it. It is nothing but a question of bargaining, and it will be found that these larger syndicates will sometimes take chances on purchases that smaller companies cannot afford to take. Often they will pay a goodly sum for an option on a property, only to find on further exploration that the property does not live up to their expectations and the amount paid is forfeited.

HOPES ARE CAPITALIZED

Then it is unlikely that any company is going to spend any great amount of money in the development of a property without having a control, so that the seller must expect to give up at least a control and he must not expect to receive more than it is worth. Often the prospector has his hopes capitalized very high, but the buyer will seldom pay much for this evidence of good-will.

Besides these larger buying syndicates there are many smaller ones of which we hear but little. These are largely represented by prominent engineers whose instructions are to be on the lookout for properties of promise. Here again, it is largely a matter of the presentation of the case in the proper form to gain their attention. More mines are rejected from the character of the first letters or reports received than from any other one source.

Then the Arizona Chapter of the American Mining Congress maintains an office in Phoenix, with a local branch in Globe and Tucson. One of the main objects of these offices is to bring together the buyers and sellers of mining properties, and also to stimulate interest in the industry. The Arizona State Bureau of Mines also takes care of a great deal of this work, but the great difficulty of this bureau, as well as the American Mining Congress, is due to the kind of reports that is sent in by the sellers. They do not tell the most important facts and do tell a lot that is useless as a recommendation for a property. Hence these local agencies, whose work is entirely with the idea of benefiting the industry, cannot send out lists of the owners of properties, because they have no authentic data regarding them.

If the inquiries of purchasers were merely answered by the sending of a long list of properties with no knowledge of their merits, the buyers would soon learn not to bother with these agencies, as they would but obtain a large quantity of chaff with the wheat, and the trouble of separating this chaff would be considerable. Hence it is the desire of these local agencies to be able to recommend to prospective purchasers properties which have the earmarks of promise, and which are worthy of investigation. By showing some discrimination, these local offices will soon get a good reputation in this line and will shortly be looked to by the companies desiring mines as the proper place to go to save time and trouble.

HOW TO PRESENT CASE

It will be seen from the above that the question of properly presenting your case is of the most vital importance in the selling of wade through, and has no influence on the value. Then, he must not set a prohibitive price on the mine.

During the past few months, the State Bureau of Mines has had many letters and reports relative to mining properties, but in few cases the definite information that a buyer wishes was included. Long descriptions of scenery and climate take up a good part of many reports, but these things rarely have any influence on the value of the property. The acreage owned is often brought out in minute detail, yet this has little to do with the value, as it is the size of the deposit rather than the land around it that is of interest.

Although many reports show a large acreage, it is rare to get a map showing the relative location of the claims, whereas the only real value of the acreage is either enhanced or nullified by the relative location of the claims. There will often be a statement that the vein is of a certain width, along with a lot of miscellaneous assays and the number of tons developed, all given in round numbers without any data showing the method of arriving at these figures.

It seems that few prospectors even know what an assay map is for, and not one in one hundred reports sent in give this most important data. Costs are utterly neglected, and the value of the ore is generally given as gross value, which means nothing to the engineer. It must not be overlooked that an exhaustive examination of a mine often costs up into the thousands of dollars, and it can hardly be regarded as the fault of the engineer if he cannot recommend to his client the spending of this money for an examination if his preliminary information tells him nothing. The business feature of the enterprise is almost always overlooked in a report, and the question "Will it pay?" cannot even be guessed at.

ASSAY MAPS SCARCE

Most of the mines brought to our attention have been mines with some development work, and often with some underground showing. It is not always possible to get all of the data required in a report of a prospect, but in the greater number of cases some semblance to an assay map may be made. However, it is seldom that an assay map accompanies a report, although when one does accompany a report and shows satisfactory results, buyers can almost always be induced to make further examination. Any prospector can make a sketch map showing the width of the vein at various intervals. Any prospector can sample by trenching the vein at the same intervals and put the results on the map. He may not know how to figure tonnage and value from these maps, but the engineer can figure the value if there is sufficient data at hand.

The engineer desires to know primarily if there is a reasonable chance of making it pay. Then he desires to know the composition of the ore. The costs are a most important feature of a report and particularly if any ore has been taken from the property, the actual cost of production is important, the cost of drifting, sinking, wages paid, fuel supply, etc., are important, but climate scenery topography, etc., are only of interest in so far as they affect the costs.

Then if the engineer gets the data that will allow him to do a little figuring himself, the report is more likely to be verified. There is no doubt that a great many properties of merit fail to attract attention because of the indefinite and unbusinesslike way in which the facts regarding the property are presented.

THE MATTER OF PRICE

According to Hoover, the value of a mine depends upon four factors:

1. The profit that may be won from ore exposed.
2. The prospective profit to be derived

from the extension of ore beyond exposures.
3. The effect of the price of metals.
4. The efficiency of the management during realization.

The only positive feature is the first, which may be determined by sampling or test treatment runs, and even this is but approximate. The second and third are largely speculative, and are based on geological evidence and industrial outlook The fourth is a question of capable executive control. It is a mine The man with the mine for sale must excite interest in his proposition, must not give inconsistent statements, but merely state what concerns the value of the property, and not fill the letter or report with a lot of useless information that takes time to absolutely impossible to value accurately any mine, as there are too many speculative factors involved A minimum and a maximum value may be determined, the minimum being with the least risk, and the various stages above being with the greater degrees of risk Furthermore, the life of every mine is limited, and the valuation cannot be based upon simple interest Then the metallurgical treatment is an essential factor.

The price that a buyer is willing to pay for a mining property is dependent on the risk of loss of his investment and on the profits he estimates can be made over and above the total cost of developing and equipping For instance, a claim on which little work is done represents the maximum of risk; the value therefore is low, whereas the mine with ore already blocked out and needing only equipment to make it pay involves little risk and the value is high But a developed mine usually sells for more than the net profit to be derived from the ore blocked out, as it is assumed that there is an extension of the ore. This is the risk that has to be assumed by the buyer. These represent two extremes; as development increases the risk decreases

It would be impossible to give any general rule as to the valuation of prospects or even developed mines, but if it is looked at in the light of the risk involved in the spending of money for the property and its development, it would be found that the price of many prospects would take a tumble downwards and would be nearer within reason No legitimate mine operator is paying very much for the optimism of the prospector, but is paying for what can be seen or indicated, and many such buyers may be found ready and willing to pay all that a mine is worth to them.

METAL MINE OPERATORS LIKE NEW ACCIDENT FORM

A gratifying percentage of metal mine operators have requested the new mine accident record forms which have been prepared by the Bureau of Mines. The State of New York has adopted this form and has recommended its use to all metal mine operators.

PERSONALS

Kirby Thomas, a mining engineer of New York City, was in Washington last month.

Charles S. Keith, a director of the American Mining Congress, spent several days in Washington, early last month.

S. H. Chauvenet, an iron and steel manufacturer of Philadelphia, who has been connected prominently with the development of tin deposits in the Franklin Mountains near El Paso, was in Washington last month.

George Watkin Evans was in Washington last month on a business trip.

Samuel A. Taylor, of Pittsburgh, Pa., a director of the American Mining Congress, was in Washington on business early last month.

George I. Davis, the geologist in charge of the Pacific Division of the Geological Survey, with headquarters at Sacramento, is in Washington on business connected with his official duties.

J. S. Diller, of the U.S. Geological Survey, will address Hunter's College March 9, and on the following day will address the Physiographer's Club at the Columbia University.

.James H. Gardner and F. B. Van Horn are cooperating at Tulsa, Okla., in general work as consulting petroleum geologists. Both Mr Gardner and Mr Van Horn formerly were with the U. S. Geological Survey.

J. L. Steele, of Landlock, Alaska, spent several days in Washington last month on business.

John I. Campion has returned to Denver from Hot Springs, Ark., very much improved in health.

A. D Parker has resigned as President of the Colorado and Southern R. R. at Denver and will hereafter reside at Philadelphia. Mr. Parker realized a fortune from the proceeds of the Florence mine at Goldfield, Nev., discovered and developed by his prospecting partner whom he financed for many, many years before the lucky development which made both wealthy.

R. Dawson Hall, of Coal Age, was a visitor at the office of the Mining Congress last month. He was in Washington attending the Safety-First Exhibition held under the auspices of the Government.

AMERICAN MINING CONGRESS

OFFICERS AND COMMITTEES, 1916

OFFICERS

Carl Scholz, President
Harry L. Day, First Vice President
M. S. Kemmerer, Second Vice President
James E. Talmage, Third Vice President
J. F. Callbreath, Secretary

EXECUTIVE COMMITTEE

Carl Scholz Chas. M. Moderwell
Walter Douglas

DIRECTORS

W. J. Richards, Pottsville, Pa.
Dr. Jas. E. Talmage, Salt Lake City, Utah
Chas. M. Moderwell, Chicago, Ill.
Dr. Wm. B. Phillips, Golden, Colo.
M. S. Kemmerer, New York City
E. A. Montgomery, Los Angeles, Cal.
Samuel A. Taylor, Pittsburgh, Pa.
L. A. Friedman, Lovelock, Nev.
Carl Scholz, Chicago, Ill.
Harry L. Day, Wallace, Idaho
Charles S. Keith, Kansas City, Mo.
Walter Douglas, Bisbee, Ariz.

COMMITTEES, 1916

STATE VICE-PRESIDENTS

Alaska	B. F. Millard	Valdez
Arizona	W. B. Twitchell	Phoenix
Arkansas	C. C. Woodson	Huntington
California	Charles E. Knox	Berkeley
Colorado	Irving T. Snyder	Denver
Georgia	W. H. Fluker	Thomson
Idaho	James F. McCarthy	Wallace
Indiana	J. C. Kolsem	Terre Haute
Illinois	F. W. DeWolf	Urbana
Kansas	Joseph Fletcher	Frontenac
Michigan	Charles E. Lawrence	Palatka
Missouri	W. B. Shackelford	Webb City
Minnesota	F. O. Hammer	St. Paul
Montana	James L Bruce	Butte
Nebraska	Frank A. Manley	Omaha
New York	Charles H. Smith	New York City
Nevada	C. B. Lakenan	McGill
New Mexico	T. H. O'Brien	Dawson
Ohio	W. R. Woodford	Cleveland
Oregon	Harold N. Lawrie	Portland
Oklahoma	Dorset Carter	McAlester
Pennsylvania	Morris Williams	Philadelphia
South Carolina	H. L. Scaife	Clinton
Texas	D. C. Earnest	Dallas
Virginia	E. A. Schubert	Roanoke
Wisconsin	F. O. Granberg	Oshkosh
Wyoming	W. D. Brennan	Cheyenne
West Virginia	Ernest Chilson	Rush Run
Washington	Col. W. T. Perkins	Seattle

REVISION OF MINERAL LAND LAWS

E. B. Kirby, St. Louis, Mo., *Chairman*

L. V. Ray	Seward, Alaska
Will L. Clark	Jerome, Ariz.
E. H. Benjamin	San Francisco, Cal.
Victor C. Alderson	Denver. Colo.
J. H. Richards	Boise, Idaho
Wm. Scallon	Helena, Mont.
Horace V. Winchell	Minneapolis, Minn.
E. B. Kirby	St. Louis, Mo.
D. C. McDonald	Ely, Nev.
C. T. Brown	Socorro, N. Mex.
Isadore Broman	Austin, Tex.
W. H. King	Salt Lake, Utah
L. K. Armstrong	Spokane, Wash.

SPECIAL COMMITTEE ON REVISION OF MINERAL LAND LAWS, TO ACT WITH SIMILAR COMMITTEES FROM THE AMERICAN INSTITUTE OF MINING ENGINEERS AND THE MINING AND METALLURGICAL SOCIETY OF AMERICA

E. B. Kirby, St. Louis, Mo., *Chairman*

George E. Collins	Denver, Colo.
Will L. Clark	Jerome, Ariz.
George Wingfield	Reno, Nev.
Thomas [illegible] Robinson	San Francisco, Cal.

ALASKAN AFFAIRS

Falcon Joslin	Fairbanks, Alaska
George C. Hazelet	Cordova, Alaska
M. D. Leehey	Seattle, Wash.
William Griffith	Scranton, Pa.
T P McDonald	Helena, Mont.

WORKMEN'S COMPENSATION

T. L. Lewis, Charleston, W. Va., *Chairman*

David Ross	Springfield, Ill.
Hon. Thomas Kearns	Salt Lake City, Utah
W. R. Woodford	Cleveland, Ohio
J. C. Kolsem	Terre Haute, Ind.

UNIFORM MINE REPORTS

Samuel A. Taylor, Pittsburgh, *Chairman*

E. T. Bent	Chicago, Ill.
J. C. McKinley	Wheeling, W. Va.

CONFERENCE WITH FEDERAL TRADE COMMISSION

Charles M. Moderwell, Chicago, *Chairman*

Hugh Shirkie	Terre Haute
M. S. Kemmerer	New York
Harry N. Taylor	Kansas City
F. S. Landstreet	New York City

STANDARDIZATION OF ELECTRICAL EQUIPMENT

In Coal Mines

Geo. R. Wood, Philadelphia, Pa., *Chairman*

S. A. Taylor	Pittsburgh, Pa.
J. R. Bent	Oglesby, Ill.
G. T Watson	Fairmont, W. Va.
H. M. Warren	Scranton, Pa.
G. A. Schreier	Divernon, Ill.
W A. Thomas	Pittsburgh, Pa.

In Metal Mines

H. S. Sands, Denver, Colo., *Chairman*

C. A. Chase	Denver, Colo.
Sanford B. Belden	Columbus, Ohio

MINERAL STATISTICS

Otto Ruhl, Joplin, Mo., *Chairman*

Fred'k Burbidge	Spokane, Wash.
J. C. Dick	Salt Lake City, Utah

FORESTRY RELATIONS

Carney Hartley, Denver, Colo., *Chairman*

F. J. Alexander	Denver, Colo.
C. H. Gibbs	Salt Lake City, Utah
William McDermott	Tucson, Ariz.

MINE TAXATION

In Metal Mines

D. L. Webb, Denver, Colo., *Chairman*

Prof. L. A. Young	Urbana, Ill.
John Wellington Finch	Denver, Colo.
D. W. Brunton	Denver, Colo.
John M. Hayes	Salt Lake City, Utah

BUREAU OF MINING ECONOMICS

S. D. Warriner	Philadelphia, Pa.
F. S. Peabody	Chicago, Ill.
B. F. Bush	St. Louis, Mo.
D. W. Brunton	Denver, Colo.
Dr L. D. Ricketts	Warren, Ariz.

THE MINING CONGRESS JOURNAL

SAFETY—EFFICIENCY—CONSERVATION

VOL. II

No. 4

APRIL, 1916

Edward T. Taylor

Leader in fight for better mining laws.

PUBLISHED BY
THE AMERICAN MINING CONGRESS
PUBLICATION OFFICE
MUNSEY BUILDING WASHINGTON, D. C.

$ 2.00 PER YEAR

20¢ PER COPY

WILMOT ENGINEERING CO.

Works, White Haven, Penna.
HAZLETON, PENNA.

MANUFACTURERS OF

HIGH GRADE MACHINERY

FOR THE PREPARATION AND HANDLING OF

ANTHRACITE COAL

WILMOT RIVETLESS CHAINS for Conveyors for Elevators for Car Hauls

LLOYD COMPOUND (HOLLOW GROUND TOOTH) ROLLS

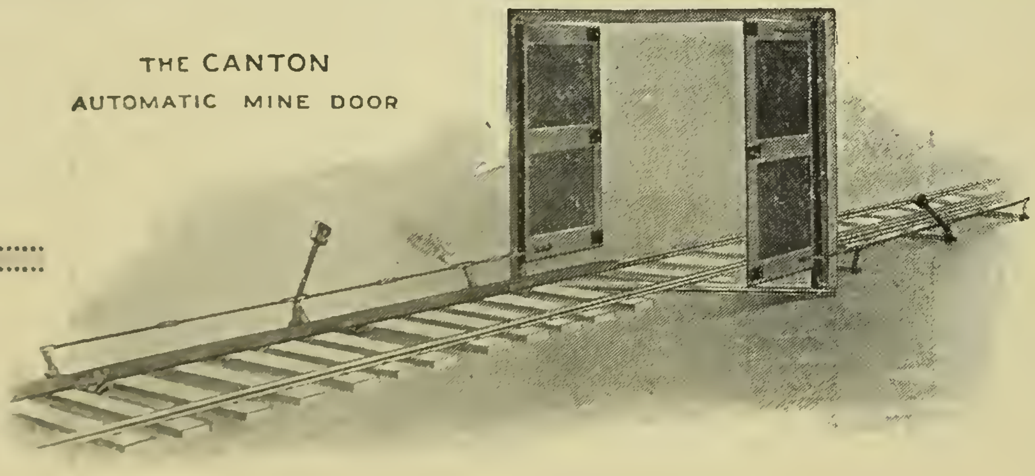
PARRISH Flexible Arm SHAKERS

SIMPLEX JIGS

handling
crushing
screening
cleaning

BEST SERVICE — LONGEST LIFE — LOWEST COST OF UP-KEEP

Let us figure with you on your new installation or replacing your old and obsolete ones



IMPROVED METHODS

Without Additional Expense

IF you contend for old time methods, you might try keeping time by employing a boy with a hammer and gong, to strike off the hours as indicated by a sun dial. ¶ A trial, however, will convince you that a good clock is cheaper and more reliable. ¶ So is the Canton Automatic Mine Door better than a trapper boy. ¶ Write for literature.

THE AMERICAN MINE DOOR COMPANY, Canton, Ohio

Vol. 2, No. 4 Washington April, 1916

THE MINING CONGRESS JOURNAL

Official Organ of the American Mining Congress

ORGANIZATION OF THE JOSEPH A. HOLMES SAFETY ASSOCIATION COMPLETED

Van H. Manning is First President of National Organization Which Will Conduct Campaign to Stimulate Safeguarding of Life in Mining Operations—Dr. David T. Day is Appointed Secretary

Organization of the Joseph A. Holmes Safety Association has been completed. Meetings were held March 4 and March 16, at which an executive council was selected, a secretary and treasurer appointed and committees named.

Dr. David T. Day was elected secretary of the association.

It was decided that the Bureau of Mines and the Smithsonian Institution should be included in the list of organizations composing the Association. It was agreed that the Director of the Bureau of Mines and the Secretary of the Smithsonian Institution should be president and vice-president, respectively, of the Executive Council, so that these offices might always be filled by residents of Washington, where the headquarters of the Association are to be located permanently.

Some suggestions were made that the safety appliance department of the Interstate Commerce Commission and other activities which are doing remarkable safety work, should be included. Mr. Manning, however, thought it would be best to confine the activities of the Association to the mineral industry. This includes mining, quarrying, metallurgical and some other activities dealing with minerals.

On an amendment offered by George Otis Smith, Director of the Geological Survey, it was determined to have the Executive Council composed of a president, two vice presidents, two members at large, a secretary and treasurer. The Executive Council was empowered to select persons to fill the office of secretary and treasurer, and it was considered best that the secretary, at least, should be a salaried official.

Another suggestion by Mr Smith was that the American Federation of Labor be represented on the Executive Committee by its president.

Hennen Jennings, the representative of the American Institute of Mining Engineers, was selected as one of the members-at-large. At the suggestion of Dr. Cottrell, of the Bureau of Mines, John Brashear, of Pittsburgh was selected as the other member-at-large.

Mr. Manning, in assuming the office as first president of the J. A. Holmes Safety Association, said:

"In assuming the office as first president of this association I want to say that I fully appreciate the honor you have conferred upon me. It is a task, but one that I will perform with all the power and force that I can give. I think if Dr. Holmes could look down from his picture on the wall and see you gentlemen perpetuating the idea he wished most to foster, he would appreciate fully what is being done.

"This meeting appeals to me. It perpetuates the memory of Dr. Holmes and encourages safety-first ideas in mining and its allied industries. It brings together, once a year, the type of men he always endeavored to get together to assist him in the work in which he was engaged."

The executive council was authorized to draft resolutions and by-laws to be presented at the next meeting of the association, which is to be held at the Bureau of Mines, March 1, 1917.

In discussing the matter of raising the necessary funds, Mr. Manning suggested that 2,000,000 people could be reached through the medium of the technical press. He also suggested that the MINING CONGRESS JOURNAL could be of very great assistance in giving publicity to a matter of this kind which it is desired to get before the mining men of the nation especially.

The purposes of the Association are set forth as follows:

That annually there be awarded one or more medals with honorariums, which would be known as "The Holmes Award" for the encouragement of those originating, developing and installing the most efficient safety-first devices, appliances or methods in the mineral industry during the previous year; these awards to be the result of reports and investigations made by the secretary and the representatives of the Association.

2. From time to time the association shall also make suitable awards for personal heroism or distinguished service or the saving of life in any branch of the mining, quarrying, metallurgical and mineral industries.

3. Once a year a meeting of the association shall be held in the city of Washington at which all awards will be publicly announced..

BANK TO HANDLE FUNDS

With regard to the appointment of a treasurer, the executive council, on a motion by Mr Walcott, designated the Washington Loan & Trust Company as fiscal advisors of the association with the understanding that the trust company would accept the services gratuitously, or if the bank would not look after this work free, the president was authorized to enter into negotiations with it with the idea of having it look after the business affairs of the association.

Dr F. G. Cottrell was elected as chairman of the committee to draw up a constitution and by-laws. A. E. Holder, of the Department of Labor, and David White, Chief Geologist of the Geological Survey, are the other members selected for this committee.

Dr. Day was elected honorary secretary of the association on motion of Mr. Manning. The secretary is authorized to select such clerical assistants as made necessary by his work with the approval of the chairman.

The members of the executive council urged J. F. Callbreath, Secretary of the American Mining Congress, to accept the appointment as secretary of the Joseph A. Holmes Safety Association. Despite his interest in this work Mr. Callbreath was forced to decline the invitation, as the constantly increasing responsibilities of the American Mining Congress are such as to require all of his time.

Those who attended the meeting March 4 were:

Hennen Jennings, American Institute of Mining Engineers; Dr. David T. Day, American Mining Congress; A. E. Holder, American Federation of Labor; Dr. Geo. Otis Smith, Mining and Metallurgical Society; Gen. W. H. Bixby, American Society of Mechanical Engineers; John H. Finney, American Institute of Electrical Engineers; Dr. F. G. Cottrell, American Electro-Chemical Society; Dr. L. O. Howard, American Assn. for Advancement of Science; S. S. Voorhees, American Chemical Society; Dr. Joseph Hyde Pratt, Geological Society of America; Dr. David White, National Academy of Sciences; Maj. Robt. U. Patterson, American Red Cross Society; Jos. D. Cannon, Western Federation of Miners; J. W. Paul, Mine Inspectors Institute; Prof. O. P. Hood (vice Prof. Wadsworth), Society for the Promotion of Engineering Education; Van H. Manning, director of the Bureau of Mines, and Geo. S. Rice, chief mining engineer, Bureau of Mines.

HENRY MACE PAYNE THINKS JOURNAL FILLS A NEED

Henry Mace Payne, a prominent New York consulting mining engineer, is interested in THE MINING CONGRESS JOURNAL. In a recent letter he says:

"Upon my return, after more than a year in the Klondyke and Siberia, I find the current copy of THE MINING CONGRESS JOURNAL. This little booklet has interested me extremely, and seems to fill completely a neglected field.

"If it is possible for me to secure, for my files, a complete set of the back numbers, I wish you would forward them to me, with the bill for them.

"Having been, as you know, an ardent advocate of the work of the American Mining Congress since its earlier days when we were all fighting for a Bureau of Mines, it is a pleasure to come back to this country and note the great progress which has been made and which, I am confident, is largely due to the indefatigable energy of Mr. Scholz and the untiring efforts of Mr. Callbreath.

"As a former secretary of one of the engineering societies, no one can appreciate better than myself, the innumerable little duties which you are called upon to perform, and which, although not recognized by the membership at large, go to make up the major portion of your actual work."

NEVADA MINING CAMPS MAPPED BY GOVERNMENT

Topographical maps have just been issued by the United States Geological Survey of the Ely and Manhattan quadrangles of Nevada. These are important mineralized areas and the maps will be of great assistance to geologists, engineers, miners and prospectors in these regions.

INCREASING IMPORTANCE OF MOLYBDENUM ORES LEADS TO SPECIAL REPORT

In Addition to Foreign Demand Permanent Domestic Market for This Metal is Expected to Develop —Ores Occur Over Wide Areas in West— They Are Mined and Concentrated Cheaply

Due to the widespread and increasing interest in molybdenum in Arizona, California, Colorado, Montana, Utah and Washington, it is expected that the following paper will attract wide attention. It is the last word with regard to molybdenum and its ores, their occurrence, production, concentration, market, prices and uses. The report is written by F. W. Horton of the Division of Mining and Technology of the Bureau of Mines, of which Dr. C. L. Parsons is the division chief.

Mr. Horton's report follows:

The extraordinary demand and the high prices being paid for tungsten and the increasing scarcity of tungsten ores, warrant more attention being paid its sister metal, molybdenum, which in a general way produces the same effects in steel as tungsten, but has the advantage that less than one-half as much need be used.

This country, and particularly the States of Arizona, California, Colorado, Montana, Utah and Washington contain many deposits of molybdenum ore. Further, molybdenum is probably of more common occurrence in nature than tungsten, its ores can be mined and concentrated cheaply, and the concentrates converted into metallic molybdenum or ferro-molybdenum as readily as tungsten concentrates can be smelted. Up to the present time, the market for molybdenum has been largely abroad, the use of the element in steel being much more popular in Europe than in this country, but there is no apparent reason why the domestic market should not develop considerably as the use of molybdenum becomes better understood.

ECONOMIC MOLYBDENUM MINERALS

Only two molybdenum minerals, molybdenite and wulfenite, are common enough to form molybdenum ores.

MOLYBDENITE

Description: Molybdenite, the disulphide of molybdenum (MoS_2), contains 59.95 per cent molybdenum and 40.05 per cent sulphur. It is opaque, lead-gray, and has a metallic luster and a greasy feel. It is so soft (hardness 1 to 1.5) that it soils the fingers readily and leaves a bluish-gray trace on paper. On porcelain its streak is slightly greenish. The specific gravity ranges from 4.7 to 4.8. Molybdenite commonly occurs in flakes or scales, resembling those of some micas in the way they may be split into thin leaves. Finely granular and massive forms are also common. Molybdenite crystallizes in hexagonal form, the crystals being tabular, or short and slightly tapering prisms.

Molybdenite is often confused with graphite, but may be easily distinguished because graphite is much lighter (specific gravity, 2.09 to 2.23) Heating a fragment of the mineral in an open tube will conclusively settle any question as to its identity, for molybdenite gives strong sulphurous fumes, whereas graphite gives none.

Molybdenite on weathering commonly forms molybdite, a hydrous ferric molybdate ($Fe_2O_3.3MoO_3.7\frac{1}{2}H_2O$) that theoretically contain 39.63 per cent molybdenum. In color, molybdite is lemon-yellow to pale yellow and occurs as an earthy powder, incrustations, fibrous masses, or capillary crystals in radiating groups. For many years molybdite was thought to agree in composition with the artificial molybdic trioxide obtained by oxidizing molybdenite, and most of the present text books on mineralogy persist in this error, giving its composition as MoO_3. Iron, however, is an essential part of the mineral. Molybdite by its color often calls attention to deposits of molybdenite which otherwise might be unnoticed

Tests. Heated in an open tube molybdenite gives off suphurons fumes and a pale yellow crystalline sublimate of molybdenum trioxide (MoO_3) is formed. Before the blowpipe, the molybdenite is infusible but imparts a yellowish-green color to the flame. On charcoal in the oxidizing flame, pulverized molybdenite gives a strong odor of sulphur dioxide and the charcoal is coated with crystals of molybdic acid which appear yellow when hot and white when cold. Near the assay the coating is copper-red, and if the white coating be touched with an intermittent reducing flame, it assumes a beautiful azure-blue color. Molybdenite is decomposed by nitric acid leaving a white or grayish residue (molybdic oxide).

Occurrence and Accompanying Minerals. Probably three-fourths of the reported occurrences and practically all of the commercial deposits of molybdenite so far discovered are in acid igneous rocks such as granites, pegmatites, and syenites, the mineral being notably at home in rocks of this type

Outside of the gangue-forming minerals such as quartz, feldspar mica, garnet, calcite, etc., the minerals with which molybdenite is most frequently associated are molybdite (its alteration product), pyrite, pyrrhotite, chalcopyrite, malachite, and chrysocolla. Other accompanying minerals are native copper, cuprite, chalcocite, bornite, tetrahedrite, azurite, galena, sphalerite, arsenopyrite, magnetite, limonite, wolframite, hübnerite, scheelite, cassiterite and bismuthenite.

WULFENITE

Description: Wulfenite is a molybdate of lead ($PbMo_4$) and theoretically contains 26.15 per cent molybdenum and 56.42 per cent lead. It is heavy and brittle, subtransparent to sub-translucent, and has a resinous or admantine luster, and generally a wax or orange yellow color. It may, however, be green, gray, brown, nearly colorless, or orange to bright red. The streak is white. The hardness is 2.75 to 3, and the specific gravity is 6.7 to 7. Wulfenite crystallizes in the tetragonal system, the crystals commonly being square and tabular, and sometimes extremely thin. The mineral generally occurs in well crystallized forms, but also in coarse or fine-grained masses.

Tests: Before the blowpipe wulfenite decrepitates and fuses below 2. With borax in the oxidizing flame it gives a colorless glass, which in the reducing flame becomes an opaque black or dirty green, with black flecks. With salt of phosphorus, in the oxidizing flame it gives a yellowish green glass which becomes dark green in the reducing flame. Heated with soda on charcoal the powdered mineral yields metallic lead. On evaporation in hydrochloric acid it decomposes, forming lead chloride and molybdic oxide. Moistening the residue with water and adding metallic zinc gives an intense blue color which persists after dilution.

Occurrence in Accompanying Minerals: Deposits of wulfenite are almost wholly in veins where it is associated with other lead minerals such as galena, cerussite, pyromorphite, vanadite, anglesite and descloizite. Gold and silver minerals also occur with it, and native gold is sometimes contained directly in the wulfenite crystals.

PROPERTIES AND USES

Physical Properties of Molybdenum: Pure molybdenum is a white metal, which is malleable, ductile and soft enough to be filed and polished with ease. However, it is seldom produced in the pure state, and its appearance depends largely upon the method of production. Reduction of the oxides or sulphides of molybdenum with hydrogen yields molybdenum as a gray powder which under heat and pressure may be compacted into a metallic bar that is brittle and even fragile. Molybdenum produced by alumino-thermic methods or by reduction in the electric furnace is a compact metal, but that produced in the electric furnace contains carbon and its physical properties differ from those of the carbon-free metal. The melting point of molybdenum is still in question. The U. S. Bureau of Standards has placed it at about 2,500° C. or 4,500° F. This is about 1,400° C. above the melting point of copper and 740° C. above that of platinum. Osmium, tantalum and tungsten are the only three metals listed by the Bureau of Standards as having higher melting points. The specific gravity of molybdenum is increased appreciably by drawing or hammering the metal, as is that of many other metals, such as copper and tungsten. The research laboratory of the General Electric Co. has determined the specific gravity of ductile molybdenum before drawing as 10.02, whereas after drawing it ranges from 10.04 to 10.32. Molybdenum wire has a tensile strength aproximately one-half that of hard-drawn steel piano wire or tungsten wire of corresponding size, and this tensile strength increases very appreciably with the fineness of the wire. In other words, the more the metal is worked the stronger it becomes. The electrical resistance of ductile molybdenum is 5.6 michromes per cubic centimeter of hard-drawn wire, and 4.8 for annealed wire, the resistivity being measured at 25° C.

Metallic molybdenum containing carbon is gray and brittle; it is also very hard and scratches steel and quartz, and even the hardest file will not cut molybdenum alloyed with a certain proportion of carbon. The melting point of the gray metal is much lower than that of the pure molybdenum, and its specific gravity is also lower, ranging from 8.6 to 8.9, according to the amount of carbon present. Pure molybdenum, surrounded with carbon and heated to about 1,500° C., absorbs carbon and becomes hard; conversely, carbon-bearing molybdenum melted with molybdenum dioxide is refined by the oxidation of the carbon in the metal.

USES AND PRODUCTION

The Uses of Molybdenum: The principal use of molybdenum is in the manufacture of special steels to which, particularly in conjunction with chromium, manganese, nickel, cobault, tungsten and vanadium, it imparts many desirable properties. These steels are used for a large variety of purposes, such as for crank and shaft forgings, high-pressure boiler plate, ordnance, armor-plate, armor-piercing projectiles, permanent magnets, wire, and self-hardening and high-speed machine tools. In a general way, molybdenum acts like tungsten in steel, but it is more active, and less is needed to produce a given result. Absolute figures as to the relative effect of the two elements cannot be given, as the effects are not exactly similar. The effective ratio of molybdenum to tungsten seems to be between 1 to 2 and 1 to 3.

Metallic molybdenum is used in various electrical contact making and breaking devices, X-ray tubes, and voltage rectifiers, and in the form of wire for filament supports in incandescent electric lamps, for winding electric resistance furnaces, and in dentistry. Molybdenum is also employed in the manufacture of chemical reagents, dyes, glazes, disinfectants, etc.

Production of Molybdenum Ores: Queensland, New South Wales and Norway have to date, furnished the most of the world's production of molybdenum, the output from all other countries, including the United States, probably not amounting to 10 per cent of the total. Austria, Canada, France, Germany, Great Britain, Japan, Mexico, Natal, Russia, Sweden, and Australian states other than those mentioned, have at times made a small production of molybdenum ore, but the output has been too small to be worth consideration.

The first official record of the production of molybdenite in Queensland was in 1900, when the output amounted to 12.3 short tons of high-grade material. In 1914 the output was 87.1 short tons, valued at $185,830. The total production to the end of 1914 was approximately 1,030 short tons value at about $760,000.

A production of molybdenite in New South Wales was first reported in 1902. In that year the output was 16.8 short tons, and the total production to the end of 1914 was 498 short tons, valued at $264,000.

In Norway the production of high-grade molybdenum concentrates has averaged about 30 tons per annum since 1902. The principal molybdenite producing districts are in the provinces of Lister and Mandal, and Nedenais in the extreme southern end of the peninsula.

United States: The largest production of molybdenum ore in the United States was in 1903, when 795 short tons of wulfenite and molybdenite concentrates, valued at $60,865, were marketed[1]. Probably 750 tons or more of this material were wulfenite concentrates obtained by sluicing old tailing piles at Mammoth, Ariz. The remainder consisted of molybdenite concentrates, probably derived from the Crown Point Mine, Chelan County, Wash., with perhaps a ton or two from the mine of the American Molybednum Co. at Cooper, Me., and from other sources. Previous to 1903, practically the entire output of molybdenum ore consisted of 20 to 30 tons of high-grade material from the Crown Point Mine. From 1903 to 1914 the production of a marketable molybdenum product has been recorded in only three years, 1905 to 1907, inclusive, and the output was confined to small lots of molybdenite derived largely from the Crown Point Mine and from a deposit near Homestake, Mont., and to a few tons of wulfenite concentrates from Arizona. The production in 1914 consisted principally of a small tonnage of wulfenite concentrates obtained from an experimental mill erected to retreat the tailings at Mammoth, Ariz., already referred to. Small lots of molybdenite from the Crown Point Mine and from a mine near Porvenir, N. M., were also marketed in 1914.

The production of both molybdenite and wulfenite increased notably in 1915. Shipments of or were made in January, 1915, from a molybdenite prospect on Red Mountain, near Empire, Colo., and are understood to have continued at the rate of 50 or 75 tons per week of material containing from 2 to 4 per cent MoS_2, until the mine was shut down for the winter.

A firm in Denver, Colo., which purchased small quantities of molybdenite ore for concentration, is said to have marketed about 15 tons of product containing approximately 75 per cent MoS_2. It is reported that another company in Denver, Colo., contracted to concentrate 500 tons of low-grade molybdenite ore from a deposit on Bartlet Mountain, Summit County, Colo., and that several hundred tons of low-grade ore from neighboring claims were concentrated by flotation, with fair results, at Leadville, Colo. A considerable tonnage of low-grade molybdenite ore was mined by the Leviathan Mines Corporation near Copperville, Mohave Co., Ariz. Other molybdenite prospects throughout the west produced small quantities of ore, and in a few instances small lots of high-grade molybdenite prospects throughout the West mining, followed by hand picking. The production of wulfenite also increased. The small mill at Mammoth, Ariz., was enlarged to over twice its former capacity, and during the summer produced wulfenite concentrates, containing about 22 per cent MoO_3 at the rate of 2 tons per day. Considerable development work was done on the Old Yuma Mine near Tucson, Ariz., and a small mill was erected for concentrating the wulfenite ore. A small production of wulfenite is also said to have been derived from a deposit about 30 miles west of Cutter, N. M.

Although no official figures of production are available, it is believed that the output of molybdenum contained in the molybdenite and wulfenite ores mined in the United States in 1915 will compare favorably with that of any other country. Whether the production will continue to increase in the future depends entirely upon the demand.

Canada: Canada has many promising deposits of molybdenite ore, but to date the production has been largely confined to small lots of high-grade material obtained by cobbing and hand-picking ore from rich streaks in certain deposits in the provinces of Ontario and British Columbia. These lots, usually from 500 to 2,000 pounds in weight, have been largely sold to chemical manufacturers in the United States, although a few have been shipped to England. In addition, perhaps 100 to 200 tons of medium-grade molybdenite ore have been shipped to the United States or England for concentration.

(Continued on page 200)

---

[1] Pratt, Joseph Hyde, Steel Hardening Metals, Mineral Resources, U. S. G. S., 1903, page 308.

TRADE COMMISSION TO AID UNIFORM ACCOUNTING MOVE

Aid in obtaining a uniform system of accounting for coal mines has been promised by the Federal Trade Commission. The matter was discussed at length by Samuel A. Taylor, chairman of the Uniform Mines Reports Committee of the American Mining Congress, and James F. Callbreath, secretary of the American Mining Congress, with Edward N. Hurley, of the Commission. The following committee report has been submitted by Mr. Taylor:

"Mr. Callbreath and myself called on Vice-Chairman Hurley, of the Federal Trade Commission in Washington, relative to a uniform system of accounting for coal mines. We did not meet with much success so far as getting the Commission to undertake this work, but we did meet with this definite suggestion, after discussing the matter at some length with Mr. Hurley, namely, Mr. Hurley suggested that we go back to our associations of operators in the various districts, and have them undertake to work out a uniform system of accounting for coal mines, and the Commission would render any assistance it could in the way of helping to get them put into use.

"It, therefore, resolves itself into this, that in each separate association of operators, we should endeavor to have a committee of the best accountants get up a form of accounting as complete and concise as possible, and then try and arrange a joint conference of representatives of the different associations to work out, if possible, a common system from those suggested.

"This can be done very satisfactorily, if we can get the cooperation of the coal operators in the different sections of the country. In fact, if we can get two or three associations to work on this, and have them agree on a uniform system, I believe the others probably will follow and endeavor to have such a system put into practice.

"Mr. Callbreath is bringing the matter to the attention of the different departments in Washington who may appoint men who will get together and agree upon a uniform report for these different departments. If we can accomplish this in the national government I think it probably will not be such a difficult task for the operators in the different states to have their respective state departments adopt reports similar to those of the national government."

Sell Maps for Five Cents

In order to place within the reach of every school child in the United States an excellently executed map, the Geological Survey is preparing maps of the individual states which will sell for five cents each. They are photo-lithographed reproductions of the maps being used in the compilation of an international map of the world.

METHANE QUADRUPLES WHEN FAN IS SLOWED DOWN

H. I. Smith, of the Bureau of Mines, is cooperating with the State mine inspection department of Indiana in determining the rate of accumulation of methane at the working face in a mine where it has been the practice to slow down the fan at shot firing, a practice followed at a number of the mines in Indiana. The results of the tests showed that the methane content rose from 0.27 to 1.02 per cent during the 40 minutes that the air was shut off from this part of the mine, or, in other words, increased almost fourfold.

U. S. IMPORTS STRONTIUM; NEGLECTS DEPOSITS HERE

Despite the presence of promising deposits of strontium in northwestern Ohio and southeastern Michigan, no ore of this character is mined in the United States. There are also deposits in Colorado and Arizona.

This ore is imported to the extent of 3,000 tons per year from England and Sicily, and is used in making red fire for fireworks and night signals.

In Europe strontium hydrate is used in sugar refining. It is held to be much more efficient than the lime process used in this country.

Install Electric Cap Lamps

H. I. Smith, of the Bureau of Mines, assisted the Vandalia Coal Co. in making the first installation of electric cap lamps in the State of Indiana. Analyses of the return air on one of the haulage ways where open lights were used showed a methane content of as much as 0.82 per cent, which is exceptionally high for the return air of a traveling way in an American bituminous coal mine where open lights are used.

FIRST-AID WORK IN MINES TO BE STANDARDIZED

While standardizing accident figures, mining regulations and other matters coming under its jurisdiction, the Bureau of Mines is not overlooking the standardization of the first-aid treatment.

Three consulting mining surgeons on the Bureau of Mines' staff recently conferred with other experts in first-aid treatment, and drew up standard regulations which soon will be published by the Bureau.

Dr. M. J. Shield, of the American Red Cross, also was a party to the conference, and approved the standard methods which soon will be in force among all Bureau of Mines' first-aid men. An effort will be made to have them adopted by all the first-aid teams.

GEOLOGICAL SURVEY AND BUREAU OF MINES ASSETS IN CASE OF WAR

Modern Warfare Calls For Large Number of Specialists Who Can be Furnished by These Two Bureaus—Even Minor Officers in Army Now Furnished With Topographic Maps—Mining Engineers, Geologists and Chemists in Much Demand

It is doubtful if even the War Department itself has an accurate conception of the service which could be rendered the country in case of war by the engineers connected with the Geological Survey and Bureau of Mines. Attaches of these bureaus could be used to great advantage if extensive military operations should become necessary. In the Geological Survey there are more than 400 professional men. In the Bureau of Mines are a number of engineers and other experts in addition to its large corps of trained first-aid men, both in the Bureau itself and among the affiliated organizations.

Most of the professional men in the Geological Survey have had many years of field service. They include topographers, hydrographers, geologists and chemists. The Survey is the one branch of the government service having an organized corps of topographical engineers. In the topographical division of the survey there are nearly 200 men who are expert map makers, all of whom are accustomed to field conditions. They are ready for service at practically an hour's notice and could be used in reconnaissance and detailed surveys, which are invaluable in military maneuvers.

SANITARY ENGINEERS

There are seventy-five hydrographers. Many of these have had special experience in sanitary engineering. There are twelve men on the Survey staff who have made a specialty of water supply. Most of the geologists have a considerable technical knowledge of mining, underground surveying and excavation. Since modern warfare has made necessary such extensive excavations the geology of the country selected for a line of trenches would have an important bearing on the success of the operations. As the "digging-in" methods, so necessary in warfare, today also carry with it extensive tunneling operations, with the idea of exploding mines under enemy trenches, the need for geologists and mining engineers is very much greater than ever before has been the case.

Germany, as well as the other countries engaged in the present war, is making good use of her geologists and chemists. It is believed that the United States is better equipped with experts along this line than is any other country, and it has been suggested to the War Department that all data relating to the possible service that such men could render, should be gotten together. Other advantages are that men in the government service have their records on file. Their reliability and particular adaptability are well understood. No time would need be lost in investigating the trustworthiness or particular qualifications of the man selected.

MAPS A NECESSITY

In time of war, especially under present conditions, no arm of the service is more important than the corps which makes topographical maps. The German army is furnishing topographical maps to even subordinate officers.

In addition to the topographical engineers on the survey staff there are many assistant topographers who could be of equal service.

There are, too, a large number of men who have been trained in the Geological Survey, but who have entered into private employment or have undertaken the private practice of their profession. Many of these men would be available and through the Geological Survey could be reached almost as quickly as men in actual service.

The Geological Survey has more data on the geography of North America than any other institution in the country. It has mapped the larger portion of the United States, but even where topographical maps have not been prepared, sufficient data exists in the files of the Survey to make very accurate maps of the region. What is very important is that this data be available at a moment's notice. The Survey is equipped to furnish a large map order promptly. When the battleship fleet unexpectedly was ordered to make a world cruise, it was necessary to prepare in two weeks' time a large number of foreign charts. Telegraphic inquiries were sent broadcast, but no private firm was in position to handle the order in the short time that was at the disposal of the Navy Department. It was necessary to fall back on the Geological Survey and the entire order for maps and charts was prepared in less time than was stated in the exacting requirement. Geologists and engineers in the service of the Survey are engaged in a work which requires a very intimate knowledge of many parts of the country. While collecting their technical data they, naturally, become familiar with trails, conditions of the roads, resources and know something of the general characteristics of the region and it is probable that there is no area in the United States or Alaska that is not known to some member of the Geological Survey. They would be able to indicate something as to the amount of supplies the district could furnish and what the prospects would be for handling heavy transportation. In fact some army men are of the opinion that no strategic operations should be taken without consulting with government men in the Geological Survey.

KNOW GOVERNMENT METHODS

These men are familiar with government methods of accounting and know the details of the manner in which government business is done. Some could be used effectively prehaps in the quartermaster's department. Men who have been party chiefs in survey work should be well fitted to handle men and look after transportation and supplies.

It also is a fact that a large percentage of the engineers connected with the Survey are familiar with foreign countries, and would be able to give considerable expert information that might not be obtained so readily otherwise. There are a number who are familiar with one or more foreign languages and doubtless would be of service in this regard. For instance at least one member of the Geological Survey's present staff is familiar with the area through which the punitive expedition into Mexico has passed. He not only speaks Spanish, but is familiar with the geography and water resources of the country and has a good idea of the source of supplies.

"Packing" horses is almost a lost art in this country, but there has been no chance for a large percentage of the Survey's men to have become unfamiliar with this operation, which is so necessary in military movements. A considerable number of these men are expert rifle shots and some few of them have had the advantage of military training.

Names, official designations and salaries of employes of the U. S. Geological Survey who resigned their positions between August 1, 1914, and March 20, 1916, are as follows:

David T. Day, Geologist, $3,600; Max A. Pishel, Associate Geologist, $1,800; Robt. H. Randall, Junr. Topographer, $780; Edgar C. Bain, Junr. Chemist, $1,200; Chas. T. Kirk, Junr. Geologist, $1,080; Calvin S. DeGolyer, Junr. Engineer, $1,320; Clarence D. Parker, Junr. Chemist, $1,200; Carl D. Smith, Asso. Geologist, $2,160; Will R. Chenoweth, Junr. Topographer, $1,080; Howard Kimble, Asst. Engineer, $1,620; James R. Ellis, Topographer, $1,800; John L. Lewis, Asst. Topographer, $1,500; Edw. W. Parker, Coal Specialist, $1,000; Frank B. Storey, Junr. Engineer, $1,380; Calvin T. Moore, Junr. Topographer, $900; James H. Hance, Asso. Geologist, $1,620; Edwin S. Fuller, Asst. Engineer, $1,920; Victor H. Barnett, Geologic Aid, $720; Walton VanWinkle, Asst. Chemist, $1,800; Howard T. Critchlow, Junr. Engineer, $1,200; Waldemar Lindgren, Geologist, $5,000; Elmer A. Porter, Asst. Engineer, $1,920; Glen M. Ruby, Junr. Topographer, $780; Heath M. Robinson, Geologic Aid, $1,080; Leon V. Fees, Junr. Topographer, $900; Lynn Crandall, Asst. Engineer, $1,620; Laurence R. Ebert, Asst. Topographer, $1,200; George W. Lucas. Junr. Topographer, $960; Frank B. King, Asst. Engineer, $5 per diem, W. A. E.; Alex. Deussen, Asst. Geologist, $6 per diem, W. A. E.

As is the case with the Bureau of Mines, some of the persons mentioned above left the service for reasons which in no way can be chargeable to the war.

An indication of the inroads which have been made in the staff of the Bureau of Mines since the opening of the war in Europe is shown by the actual list of resignations. These technical men have been induced, by the very much higher salaries offered, to accept work with the various private institutions developing industries which require special training and experience.

The Bureau of Mines requires the services of 300 technical men on its staff. The salaries are not on a parity with those paid by commercial companies. In most cases these men have been able to more than double their salaries in making the change. Those who have left the service since August, 1914, together with their rank and salary paid them by the Bureau of Mines, are as follows:

Louis A. Scholl, Jr., Junior Chemist, $1,320; David J. Price, Foreman Miner, $1,800; Archie J. Strans, Junior Mining Eingineer, $1,500; Victor B. Bonney, Junior Chemist, $1,200; Austin A. Flynn, Foreman Miner, $1,500; Amos H. Bannister, First Aid Miner, $1,200; John T. More, First Aid Miner, $1,200; Robert Back, Junior Ceramic Chemist, $1,380; Herbert M. Wilson, Engineer in Charge, $4,300; Christian G. Storm, Explosives Chemist, $2,700; Elton W. Miller, Assistant Engineer, $1,620; Max M. Shaw, Junior Fuel Engineer, $1,200; Joseph P. Bader, Junior Chemist, $1,200; Oliver W. Storey, Chemist, $2,700; J. Herbert Hunter, Junior Explosives Chemist, $1,500; Louis F. Clark, Junior Mining Engineer, $1,200; George C. Cook, Assistant Fuel Engineer, $1,620; Carl A. Taylor, Junior Explosives Chemist, $1,500; Alfred G. Heggem, Petroleum Engineer, $3,300; John C. White, Laboratory Aid, $720; Dr. James N. Lawrence, Assistant Physical Chemist, $1,500; Archie L. Hyde, Assistant Chemist, $2,160; Arthur I. Young, First Aid Miner, $1,380; James C. Roberts, Mining Engineer, $3,300; Dr. Horace C. Porter, Chemical Engineer, $3,120; George E. McElroy, Junior Mining Engineer, $1,320; Thomas C. Atterbury, Junior Explosives Engineer, $1,320; Isaac Zortman, Junior Full Chemist, $1,020;

Irving C. Allen, Chemist, $3,120; James M. Lohr, Assistant Alloy Chemist, $1,680; George G. Oberfell, Junior Chemist, $1,320; Charles Enzian, Coal Mining Engineer, $3,600; Harrison D. Mason, Jr., Assistant Mining Engineer, $1,980; Albert S. Crossfield, Junior Explosives Chemist, $1,380; John H. East, Jr., Junior Metal Mining Engineer, $1,320; J. W. Paul, Mining Engineer in charge of rescue work, $4,00; Ira Sproat, Junior Chemist, $1,500; C. B. Dutton, Law Examiner, $2,400; Arthur L. Smith, Junior Chemist, $1,200; Robt. J. Hammon, Junior Chemist, $1,260; Jos. S. Cullen, Junior Chemist, $1,500.

PLACES HARD TO FILL

Many of these men are experts in specific lines, whose places cannot be filled by men who are able to carry on the work until they have first spent considerable time in familiarizing themselves with what has been done by their predecessors. The work of the Bureau of Mines particularly has been interfered with to a considerable extent by these separations. There is some talk of legislation which will necessitate government scientists to complete specific investigations before leaving the service. On the other hand this works considerable hardship on the men who, by such a law, might lose an opportunity to accept employment at much better salaries.

In the above list is the name of J. W. Paul, who was the Mining Engineer in charge of rescue work. His separation from the Bureau of Mines cannot be charged directly to the war. He received a salary from the Government of $4,000 per year. He left the service to undertake private practice and those familiar with his ability predict that his earning capacity will be considerably more than doubled from the very start.

DUTTON GETS BIG SALARY

C. B. Dutton, Law Examiner of the Bureau, is another man whose place will be hard to fill. He has accepted services with an American company which is developing the foreign interests of the Kittman process of oil refining at something like four times the salary he was receiving.

James C. Roberts, who was a mining engineer with the Bureau of Mines, has accepted the chair in safety engineering at the Colorado School of Mines. In this position Mr. Roberts will be able to do great service in extending the "Safety-First" movement, which owes its greatest stimulus to the Bureau of Mines.

There are perhaps a few more exceptions in the above list where separations are not due to the war. Even in normal times there is a considerable change of personnel on the part of government scientists owing to the willingness of private concerns to pay higher salaries.

The Bureau of Mines is making investigations along a number of lines which are of much advantage to the country in securing a greater degree of preparedness for national defense. The following activities of the Bureau would be very helpful in case it were necessary to take advantage of the nation's resources and be in position to secure war-time efficiency:

A general investigation has been made in the manufacture and use of alloy steels. This research is of the greatest value in the manufacture of armor plate and the other many uses to which steel is put in warfare.

WOULD TEST EXPLOSIVES

Investigations of explosives have developed many important facts. In case of war it is altogether probable that the Bureau of Mines would be called upon to test explosives furnished the government.

In the past tests of coal for naval use have been made under the Bureau of Mines' supervision. Other investigations as to the use of oils as fuel, both for steam boilers and internal combustion engines, contribute not a little to the efficiency in transportation and other uses.

Now that gas is being used on the battlefield there is considerable opportunity offered to those familiar with oxygen breathing apparatus. In fact, Bureau publications on this subject were requested directly from the firing lines and have been forwarded to a destination "somewhere in France" through the British Embassy.

READ IN THE TRENCHES

The French government has requested officially the publication of the Bureau of Mines on Mining Camp Sanitation. Many of the findings in this report are applicable to military as well as the mining camps. There have been numerous calls from the trenches of northern France for publications of the Bureau of Mines and the Geological Survey.

Some of the most intricate and detailed investigations of fuses have been made by the Bureau of Mines. Extensive and highly advanced work on the behavior of nitroglycerine when heated has been done.

Another branch of research, which could be utilized to great advantage during war, would be the Bureau's investigation as to the deterioration and spontaneous heating of coal in storage. Incidentally, it has been found that deterioration can be checked and heating can be prevented by storing coal under water. Whether or not this method of storage is advantageous when all things are considered is still a matter of doubt, and just now is being specially investigated by the Bureau.

MAGAZINES FOR EXPLOSIVES

The Bureau of Mines is also investigating magazines for explosives.

Among other things the Bureau has developed that a magazine of cement mortar is practically bullet proof. Bricks of composition similar to that of Mexican adobes also are very effective for magazine construction. Of course, such investigations as there are made for industrial purposes. There have been sufficient cases of disastrous explosions of magazines at mines to safeguard powder supplies in every possible way. Considerable necessity exists for having these magazines bullet proof as a number of explosions were caused by rifle shots into the magazines.

The Bureau has made various investigations as to how persons are best resuscitated from gases. Considerable work has been done in ascertaining the best devices for firing explosives from a distance.

There are many activities on this Bureau which have a direct bearing on efficiency, which would be utilized in time of war. For instance the amount of intelligence that is being concentrated in the Bureau of Mines for the use of heavy oils in internal combustion engines may result in the solving of this important problem, which, if successful, would be revolutionary in its effect on transportation methods.

BUREAU OF MINES PATENTS REMARKABLE GAS DETECTOR

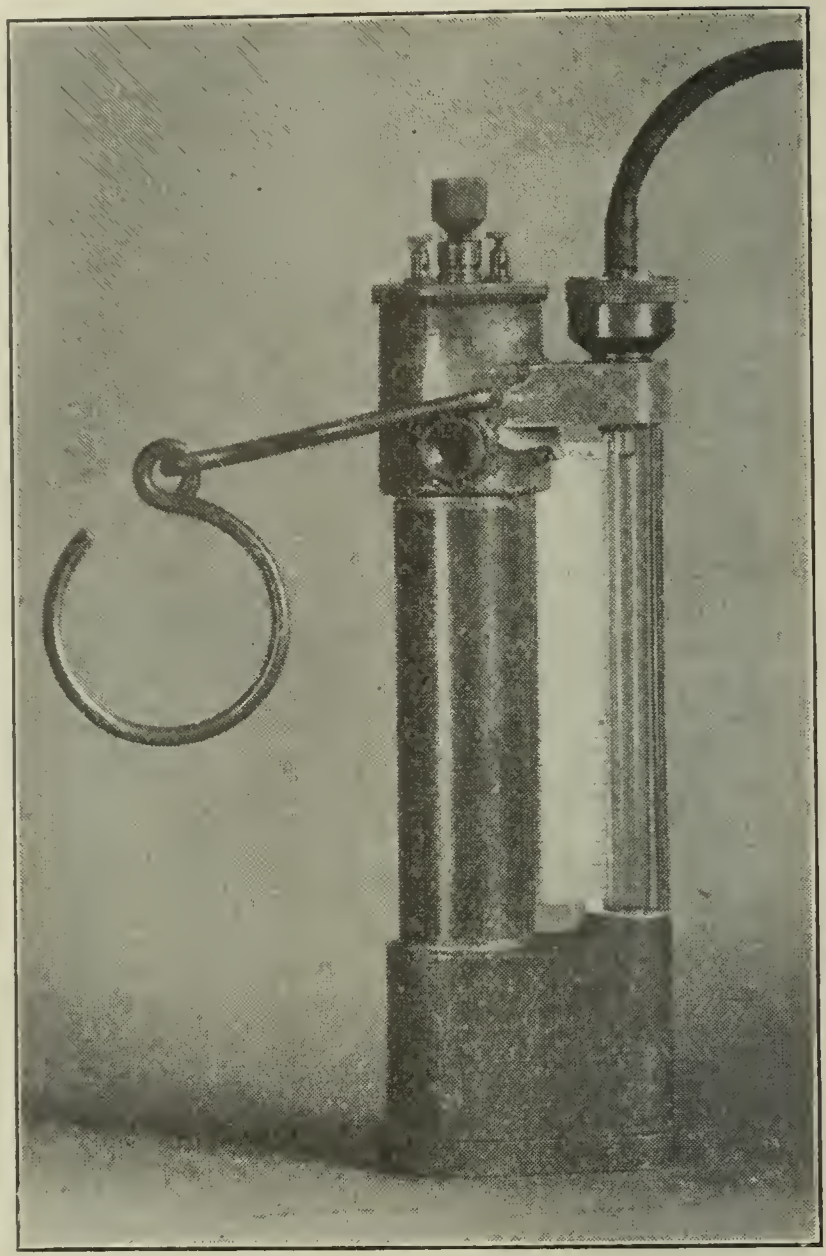
A new gas indicator for detecting explosive gases in mines and other places, invented by George A. Burrell, a chemist of the Bureau of mines, with offices at the Pittsburgh Experiment Station, has been granted a final patent.

Mining men for thirty or more years have been trying to develop a detector that would show accurately and quickly the percentage of explosive gas in mines. The Bureau of Mines' instrument, in addition to possessing these advantages, is durable in construction, light in weight, and simple enough in operation so that men without technical experience can operate it. It is accurate to 0.10 per cent.

BETTER THAN SAFETY LAMP

Compared to the safety lamp, the device at present used for detecting explosive gas in air, of which there are thousands in use in the United States, the Bureau of Mines' device is ten to twenty times more accurate, lighter in weight, stronger in construction, and possesses fewer parts.

The great need for such a device lies in the fact that fire-damp becomes explosive in mine air when as little as 5.5 per cent is present. A safety lamp, on the average, as used by different men, can not detect less than 2 per cent, so that air in a mine may contain a proportion of fire-damp close to the explosive point before it can be detected. In England if certain parts of a coal mine contain a maximum of 2.25 per cent of fire-damp the mine is shut down, in accordance with the law, and the ventilation improved before the men are allowed to resume work in the mine.



METHANE INDICATOR

Invention by Bureau of Mines man, which is attracting much attention.

PARTICULARLY VALUABLE HERE

At present, in this country, mining laws are not so strict as regards ventilation, in part because of the difficulties in the way of making precise determinations of fire-damp. Now that an instrument has been devised with which this can be done in a very simple manner, much closer supervision can be placed over the air in coal mines and many disastrous explosions prevented.

Patents have just been granted on the Burrell detector. They were taken out by the Bureau of Mines and permission will be given to responsible manufacturers to manufacture the detectors. No charge will be made for the use of the patents but the privilege of manufacture will be given only when it is assured that the public will be given the advantages of the invention without charge beyond the ordinary charge for manufacture.

W. S. Robbins, of the U. S. Geological Survey, has returned from Panama where he directed the installation of the Interior Department's exhibit at the Panama National Exposition.

BIG TONNAGE OF COAL STILL TO BE TAKEN OUT IN ROSLYN FIELD

Despite Heavy Production During Many Years, Principal Field in Washington is by no Means Worked Out, Geological Survey Expert Finds — Better Transportation Facilities will Open Gold Mining District

Consideration of the production of coal in an area is important in connection with hydroelectric development not only because of limitation in warranted cost imposed by competition with steam power in localities favored by large beds of coal that can be mined cheaply, but also because the economical development of streams lacking storage reservoirs makes necessary the installation of auxilliary steam plants to carry a portion of the demand for energy during periods of low water according to Edwin J. Saunders, of the United States Geological Survey.

Coal has been found in a number of localities in Kittis County, Washington, but only the Rosyln field in the Yakima basin is economically important, though coal is being shipped from a small mine in the Manatash formation along Taneum Creek about 10 miles west of Thorp.

The Roslyn bed, which is the principal one being worked in the Roslyn field, has given Yakima Valley first rank among the coal-producing sections of the State. The northern boundary of the bed has been accurately traced from Clealum to Jonesville, and the east and west limits are fairly well defined in the workings at Clealum and Jonesville, but the southern boundary is known only approximately. The average thickness of the bed over the whole field is 4 feet 3 inches. From the proven arear, the probable area, and the average thickness, an estimate has been made of the quantity of coal in the field and, with an estimate of future production, is shown in the *following table*. The estimate of future production was based on the percentage of coal mined in each part of the field in relation to the known coal of that section as shown by actual workings. A map on a scale of 400 feet to the inch, furnished by the Northwestern Improvement Co. and prepared about June, 1910, was used for this work. From all the information at hand it appears that about 70 per cent of the coal in the proved areas had been recovered up to that time. Improved methods of laying out workings will return a conservative estimate of 75 per cent for proved areas now beginning to be worked, and a conservative estimate indicates that 80 per cent of the reserve coal may be recovered. It is possible that this percentage may be exceeded in actual practice.

MINERALS OTHER THAN COAL

In the mountainous parts of the district considerable prospecting has been done for gold, copper, lead, iron, and cinnabar, deposits of which are known to exist. Placer mining has been practiced for years along Swauk Creek, and many prospects have been located and some development work has been done in the upper Clealum basin. Gold-bearing formations which have yielded very favorable prospects have been located at the head of American River, but development has been hampered by the high cost of transportation over roads and trails. Better transportation facilities will make mining prac-

Estimates of Future Production of Coal from Roslyn Bed

	Area in acres	*Total original tonnage*[1]	*Recovery*	
			Per cent	*Tons*
Probable area	2,221	16,524,240	80	13,218,202
Proved area unworked	4,153	30,898,320	75	23,173,740
Proved area worked	3,287	24,455,280	70	17,118,696
	9,661	71,877,840		53,510,638
Production reported by State mine inspectors, 1887–1911[2]				[2]19,455,947
Estimated future production				34,054,691

---

[1] 7,440 short tons per acre.

[2] This output is for the Roslyn bed alone. The output of all beds in Kittitas County is shown in the table on page 166

ticable and open a local market for the water powers.

Hydraulic power developments in the Yakima basin are unimportant when compared with the total water power developed in the State of Washington. The rated capacity of power machinery installed or in course of construction in the State in 1913 has been estimated at approximately 400,000 horsepower. Of this amount about 190,000 horsepower may be credited to the section of the State west of the Cascade Range and about 170,000 horsepower to the Spokane River developments. Only about 14,000 horsepower, or 3.5 per cent of the total in the State, is developed in the Yakima Valley.

The following table shows the mine production for the years 1887 to 1912, inclusive, as reported by the United States Geological Survey. The total production of the Roslyn field has been about 30 per cent of the grand total for the State.

ANNUAL PRODUCTION OF COAL IN KITTITAS COUNTY, 1887 TO 1912

	Short tons		Short tons		Short tons
1887	104,782	1897	370,657	1907	1,524,887
1888	220,009	1898	566,396	1908	1,414,621
1889	294,701	1899	661,210	1909	1,550,539
1890	445,311	1900	873,751	1910	1,661,650
1891	348,018	1901	1,012,521	1911	1,256,745
1892	285,088	1902	1,250,920	1912	1,237,427
1893	253,467	1903	1,369,716		
1894	232,580	1904	1,340,400		21,526,331
1895	281,534	1905	1,280,845		
1896	265,953	1906	1,422,612		

The Big Dirty, a bed containing about 6 feet of good coal and lying about 200 feet above the Roslyn bed, is now being worked at Jonesville by the Roslyn Fuel Co. as mine No. 2.

The fields outside of Roslyn are not at present producing sufficient coal to enable steam to compete with water power. The extent of proved area, the total content of the coal-bearing beds, and the amount probably recoverable are indicated by the following table:

PROVED AREA, PROBABLE RECOVERY, AND TOTAL CONTENT OF COAL-BEARING BEDS IN KITTITAS COUNTY

Field	Proved area Acres	Total original content Tons	Probably-recoverable Tons
Roslyn	9,661	87,680	25,600
Lower Taneum	....	768	60
Manastash	....	5,372	300
	....	93,820	25,960

TRANSPORTATION

Two transcontinental lines cross Yakima Valley and make it possible to ship the valley products to all parts of the world and to receive supplies not produced locally.

The Northern Pacific Railway—the main trunk line of the region—crosses the Columbia at Kennewick near the mouth of Yakima River and follows the river very closely almost to the source. A short branch line connects the main line at Clealum with the coal fields n the vicinity of Roslyn and Ronald. Another branch line joins the main line near Toppenish and extends into the Sunnyside district, with a terminal at Grandview. A third branch line is being constructed from Toppenish into the Yakima Indian Reservation. The total length of Northern Pacific lines in the Yakima basin is about 200 miles.

The Chicago, Milwaukee & St. Paul Railway crosses the eastern half of the drainage basin near Ellensburg and parallels the river to the source at Snoqualmie Pass. It was put into operation in 1910, but opened up very little territory that had not already been served by the Northern Pacific Railway. The total length of line in the basin is about 80 miles.

A branch line of the Oregon-Washington Railroad & Navigation Co. connects North Yakima with Walla Walla and other points in the southeastern part of the State. Surveys have been run by this company for a line extending up Neaches and American Rivers, across the Cascade divide and down White River to Puget Sound.

Two local companies are operating transportation lines in the vicinity of North Yakima. The North Yakima & Valley Railroad extends from North Yakima to Naches and Moxee, and a line is being constructed into the Cowiche Valley; and the Yakima Valley Transportation Co. operates an electric service into the Selah, Atanum, and Wide Hollow districts.

REPRESENTATIVE TAYLOR WANTS WEST TO STUDY FOSTER BILL

Representative Taylor, of Colorado, is very anxious to see an adequate number of the Foster bill distributed among the mining men in the country. This bill (H. R. 12275) proposes to amend and codify a section of the Revised Statutes of the United States relating to mining claims on the public domain. It is proposed as a substitute to the proposition providing for a special commission to study the revision of mining laws. With reference to this bill Mr. Taylor, who is the only man familiar with metal mining on the House Committee of Mines and Mining, says:

"The bill evidently was prepared by the Bureau of Mines and represents Judge Thompson's ideas along this line. Very little opportunity is being given to the mining men of the country to study the laws as are stated in this bill. It should be sent out broadcast to the mining industry all over the West. Every opportunity should be given for the careful study of this measure so that intelligent suggestions for amendments could be made and attention called to any omissions which should be covered by the proposed law. The bill undoubtedly will not be taken up until next winter.

"I am confident there are some good features in the bill. There are others that are unnecessary and some that are unwise. There are some provisions that may be positively injurious. Throughout twenty years of legislative service it has been my observation that no bill is ever ideal. It is necessary to pick out the grains of wheat from the chaff. I think we should give the country full opportunity to assist in selecting the grains of wheat.

"If regulations of individual mining camps are recognized by the federal statutes, it seems to me that some of the features of this bill should be open for acceptance or rejection by the individual states. If a state should want the "Apex" law, let it have it. Whether all the states wish to participate in all parts of the bill, could be determined by their legislatures before same specifying it, and in case no such notice was given the bill would go into effect. As it is there are so few copies of the bill available for distribution that comparatively few persons are having the opportunity to look over the proposed legislation."

Mr Taylor is of the opinion that active interest on the part of the metal mining people of the country will result in suggestions and changes which may allow the passage of some sort of revision of legislation during the early part of 1917.

The most desirable action to take in regard to this bill would be for mining men, having any suggestions to make, to write to their Congressmen. The members of the committee probably will not have time to give any particular attention to a volume of private correspondence with regard to the bill. Congressmen from mining districts, however, are very much interested and will give the matter careful attention it is believed.

MUCH GOOD RESULTS FROM COOPERATION IN CALIFORNIA

Bureau of Mines officials are very much gratified at the results which are being obtained by the Bureau's cooperative arrangement with the California Industrial Accident Commission. Edwin Higgins, Bureau of Mines representative, who is in direct charge of this work, has reported that all arrangements are completed for two centralized mine rescue stations which will be located at convenient points on the Mother Lode.

Investigations of the sanitary conditions of the mines in California are just beginning. This survey is aimed principally at tuberculosis and the hookworm. These are the two disease which are most prevelant among those who work underground in California. It is believed that it will be possible to reduce greatly occurrences of these diseases by certain simple sanitary measures.

Joseph White, the sanitary engineer of the Bureau of Mines, is looking after this work personally. While the campaign cannot be said to be fully under way, such preliminary work as has been done shows very gratifying results.

PENNSYLVANIA COMPANIES INCREASING THEIR INSURANCE

In the Pittsburgh district interest in safety methods in mines is greater than ever before principally because the Pennsylvania compensation law went into effect January 1, many contend. Many companies are taking out insurance with the Associated Companies, the inspection department, which is in charge of H M Wilson reports. The rating scheme of the Associated Companies penalizes coal companies for failure to have approved safety methods, but credits those companies using such methods by making their rates considerably less than the base rate. The companies, naturally are interested in adopting any practice which will result in the insurance rate being lowered. It is believed that safer operation of coal mines in this district will result and the rock-dust method of preventing coal mine explosions will be adopted more widely.

GOVERNMENT EXPERTS WELL KNOWN TO MINE OPERATORS

FRANK L. HESS, GEOLOGIST

Frank L. Hess, who specializes on the rarer metals for the Geological Survey, and is a geologist in the organization, was born in Streater, a coal-mining town in Northern Central Illinois, and at that time one of the most important in the State, on September 1, 1871.

He was educated in the common and high schools of that town, and later moved to California, where he attended Stanford University, from which institution he graduated in mining and geology in 1903. While at the university he was assistant in the assay office for three years. During two years vacation periods he worked as field assistant in the Geological Survey, and upon graduation went to Alaska as geological aide and assistant geologist, where he worked in the gold regions of Nome, Fairbanks, Eagle, the Forty-Mile Country, Rampart, and in the tin-bearing region on Lost River, Buck Creek and Cape Prince of Wales (Tin City). After leaving the Alaskan work he specialized on the rarer metals, including tungsten, tantalum and tin. He has also studied various gold deposits and has published works on gypsum deposits of California, and magnesite deposits of California, articles upon graphite, rare earth metals and other mineral deposits in many parts of the United States and Mexico.

COAL OPERATORS ANSWER STATISTICAL QUERIES PROMPTLY

Coal operators are very much more prompt in making returns to the statistical queries, which are sent out by the government, than are those in charge of other industries.

C. E. Lesher, who has charge of the coal statistics of the U. S. Geological Survey, says the cordial cooperation from coal operators is the only thing which makes possible the early publication of coal statistics.

Inquiries made at the Bureau of Census, Agricultural Department and other government departments, indicate that mining men are much more prompt in making returns than are the various other classes of business men to whom such queries are sent.

The metal mine operators are just as prompt to make returns as are the coal operators, with the exception of those engaged in placer mining. With reference to returns made by coal operators Mr. Lesher says:

"Of 4,000 inquiries sent out January 1, more than 75 per cent of those addressed have replied. This particular set of questions covers 6,000 bituminous coal mines. This is not an unusually prompt response, but represents the general average.

"Of course, it is very much more difficult to get returns from the last 25 per cent. If this latter portion would answer as promptly as the majority, it would be possible to have final figures ready for the public two or three months earlier than is possible now.

"Coke operators have replied a little more promptly than the coal men. Eighty per cent of the queries sent coke operators have been answered.

"Large operators, as a rule, reply very much more promptly than do those conducting business on a smaller scale. The smaller operator, however, is becoming more alive to the fact that his returns are just as necessary to accurate totals, and improvement is being noted in the accuracy and promptness of replies."

When replies are not made to the Survey as to production, it makes it necessary for it to get this information indirectly. Considerable machinery is maintained to secure this information from those who do not make, or who refuse to furnish it. Rather than miss any return, a representative of the Survey is sent to the locality and the exact amount of production is ascertained. So thoroughly is this done that actual figures are obtained for more than 99 per cent of the production.

HAZARDS TO MEN INCREASE AS MINES BECOME LARGER AND EMPLOY MORE MEN

Van H. Manning, Director of the Bureau of Mines, Brings Out Interesting Facts in Address to Mine Operators and Mine Inspectors at Harrisburg, Pa.—Believes Number of Deaths and Injuries Can Be Reduced by Half

Further illuminating facts in regard to mining accidents and their prevention were brought out in a speech by Van H. Manning on March 24 at the meeting of Mine Operators and State Mine officials at Harrisburg, Pa. Extracts from Mr. Manning's speech follow:

In 1914, the last year for which statistics are available, there were approximately 383,000 persons employed in or about the mines and quarries in the State of Pennsylvania, and the total fatalities among these workers were 1,028. These figures do not include the men employed at coke ovens or at various ore dressing and smelting plants, except blast furnaces, that reported accidents. Although the death rate per 1,000 men employed in mines and quarries was commendably low, being but 2.68 as compared with 3.23 for the United States at large, none of you doubt, I am sure, that fatalities from accidents can be reduced decidedly. For instance, the death rate from accidents in and about the anthracite mines in 1914 was 3.31 per 1,000 men employed, a figure that can most certainly be reduced.

OVER 1,000 KILLED ANNUALLY

The death of over 1,000 men annually in this State, and the serious injury of at least 5,000 more through causes that in part, at least, are preventable beyond doubt, are matters that deserve your serious attention. As a representative of the Federal Government, I am glad of this opportunity to contribute to the proceedings of this conference and to meet others who are engaged in a work that must appeal to everyone, the conserving of the lives of our countrymen.

It is not possible for me in the time at my disposal to discuss in detail the many causes of mine accidents and to point out all the preventive measures that may be and should be used. Nor shall I burden you with statistics of fatal and nonfatal accidents in the various classes of mines and quarries in the State, and compare these statistics with those for other States and the whole country. Neither is it my intent to dwell at length on the work of the Federal Bureau of Mines or to discuss matters concerning which opinions differ widely, such as the relative duties and responsibilities of the operators and the miners or the risks taken by miners and by men of less experience.

We are all familiar with the excellent work being done by the Pennsylvania State mine inspection service, and I believe we all are ready to acknowledge the debt that the mining industry of the country owes the chief mine inspector of this State for his efforts to make mining safer, and especially for the wealth of detailed information on mine accidents that he has given to the industry through his annual report. As that information is readily available I shall not attempt to review it, nor to discuss it in any detail. However, as the theme assigned me is "Mine Accidents and Their Prevention," I shall briefly outline some of the chief causes of mine accidents and offer for your consideration a few suggestions on their prevention. Inasmuch as out of the 383,000 miners reported as employed in this State in 1914 there were 362,000 employed in or about coal mines, I shall confine my remarks to coal mining.

THE GREATEST MENACE

Falls of roof and of coal are still, as they have been, the chief source of fatalities in coal mines. Other causes in the order of their importance are mine explosions (gas or dust, or both), mine cars and locomotives, explosions, and electricity.

The fatality rate in the Pennsylvania anthracite mines for five years, 1910-1914 inclusive, was 3.57 per 1,000 men employed, as compared with 3.31 per 1,000 in 1914. In the bituminous mines, the average rate for five years was 2.87 per 1,000 men employed, as compared with 2.18 per 1,000 for 1914. This reduction shows clearly that inspectors and operators are striving to reduce accidents, for the hazard of mining is undeniably on the increase.

The hazard is increasing because mines are becoming larger and are employing more men. Consequently, not only are there many more points in a mine at which fatal accidents may occur, but a great accident imperils the lives of many more persons. An explosion that might have killed 25 or 30 men a few years ago may now trap hundreds. Furthermore, the area of worked-out ground is larger, so that there are more abandoned rooms and entries in which gas and dust may accumulate to increase the risk of explosions as well as their violence.

DANGERS INCREASE

As mines grow larger they necessarily require more extensive haulage systems, more locomotives and more mine cars, and thus the danger from haulage accidents grows. As the mines go deeper, the upper workings of slope and shaft mines naturally become drier, and in bituminous mines the dust that accumulates in these upper workings is naturally dry, and the hazard of widespread explosions, unless preventive measures are taken, becomes much greater. Also, as the mines go deeper, the roof pressure increases, thus adding to the hazard of roof falls.

The increased risk due to these principal hazards is being combatted by efficient mine inspection in the various States, so that the fatality rate for coal mining in the United States as a whole has declined since 1907, being 4.87 per 1,000 in that year, and only 2.95, the lowest figure since 1898, in 1915. Inspection, education, and cooperation have brought about this gratifying result.

How much is being done by the State inspectors and by operators in the State of Pennsylvania will be evident from a few figures. In 1914, there were 43 companies in Pennsylvania that employed underground more than 57,000 men, yet had a fatality rate of only 1.76 per 1,000 men employed. These 43 companies averaged 566,112 tons of coal for each life lost, which is far above the average for the United States. One of the companies produced approximately 12,000,000 tons with a loss of only 12 men, or one death for each million tons of coal mined. Moreover, there are, in Pennsylvania, 13 coal companies that have not had a fatal accident in a period of 15 years. In 1914 there were 21 companies that produced in all 8,700,000 tons of coal and employed 9,144 men without having a single fatality.

EXPLOSION DANGER

Although falls of roof and coal cause by far the largest number of accidents, yet potentially there is in many mines grave danger of explosions which may kill large numbers of men, and for this reason are especially dreaded. In fact, were it not for the precautions already taken by many operators, particularly in mines that make more or less gas, the toll of life from explosions would be much larger than it is. I think one may safely say that if the mining methods and the care to prevent accidents were no better than they were 25 or 30 years ago, the number of disasters in the coal mines of Pennsylvania, because of the greater extent of the workings, the increasing depths, and the larger number of men exposed to hazards, would be appalling.

In view of the fact that some of the most gaseous mines in the world are found in the anthracite fields and that the dust in many of the bituminous mines of western Pennsylvania is highly explosive, I think that the mining industry is to be congratulated on the comparatively small loss of life from such disasters. Yet the number of deaths that do occur from explosions should be lessened. Fortunately, as regards anthracite mines, anthracite dust by itself is not explosive, but in those mines the precautions toward improving the ventilation at working faces, the increased use of electric safety lamps in place of flame safety lamps, and the more thorough education of the miners, are all tending to lessen the number of gas explosions.

SAFETY LAMPS

It is most gratifying to me that the electric safety lamp, with the development of which the Bureau of Mines has had much to do, has been so extensively adopted. I have not the figures for the number that are in use in Pennsylvania, but hope that with the new statistical forms which were planned at the recent conference of State mine inspectors in Washington such data will be available in the future.

In the bituminous fields of Pennsylvania, not only is fire-damp to be guarded against, but coal dust. Undoubtedly many improvements are being effected in the proper watering of the mines, as well as in the use of shale dust or rock dust, which has been found to be very effective in tests made in the experimental mine near Bruceton.

The efficiency of rock dust is now being tried out in cooperation with several operators in some of the large mines, and the results so far obtained are of much promise as regards both efficiency and cost. The efficiency of the method is being checked by the collection of dust in entries and rooms, after the rock dust has been applied, and the testing of these samples to determine whether the content of combustible matter is low enough to prevent propagation of an explosion. Rock dust also has the merit of acting like whitewash in whitening the surfaces of the mine passageways, so that the illumination by the miners' lights is much more effective, and in this way, probably, many lesser accidents will be prevented. The Bureau of Mines does not consider that rock dusting is any more effective in preventing explosions that watering, provided the coal dust is thoroughly wet, but there is much difficulty in keping coal dust wet where large volumes of air are circulating, whereas rock dust need be applied only from time to time (in some places not needing renewal for three or four months), according to the rate at which fine coal dust is deposited in the roadways.

Aside from the use of safer mine lamps and the greater attention given in bituminous mines to rendering accumulations of coal dust incapable of propagating an explosion, other preventive measures are having their effect.

AS TO EXPLOSIVES

Short-flame explosives were first introduced in the coal mines of Pennsylvania at Johnstown in 1902, and since that date their use has increased rapidly. In 1909, the Federal Government established at Pittsburgh a station where explosives are tested to determine their permissibility for use in dusty or gaseous coal mines. The explosives that pass the tests and are approved for use under prescribed conditions are termed permissible explosives. Through the introduction of these quick-flame explosives a potential danger to life has been greatly lessened.

In the bituminous coal mines the fatality rate from explosions has been reduced from 3.39 per 1,000 men employed, in 1903, to ninety-six hundredths per 1,000 men in 1914, largely as a result of the use of permissible explosives.

ELECTRICITY

Investigations have been made to determine the extent to which the use of electricity in coal mines may cause dust or gas explosions, and the ways in which the risk of miners being injured or killed by shock may be lessened. As the result of these investigations manufacturers have devised safer types of apparatus and the State of Pennsylvania has enacted a most excellent law governing the use of electricity in coal mines.

RESCUE APPARATUS

The relative merits of the various types of apparatus used by miners in rescue and in first-aid work at a mine disaster have been investigated, with the result that important improvements have been made. In connection with this investigative work the Bureau of Mines has conducted an educational campaign among miners throughout the country, training them in rescue and first-aid methods, so that in the event of a disaster there may be a sufficient number of trained men at or near the mine ready for immediate rescue and first-aid work.

With the cooperation of miners and mine operators, the bureau has developed this work, done through its rescue cars and stations, into an agency for aiding in the rescue of men imprisoned by mine disasters, for training miners in rescue methods and in first aid to the injured, and in advancing the general movement toward greater safety in all branches of mining. Not the least of the benefits resulting from this work is the promotion of good citizenship among miners through the demonstration of the Government's interest in their welfare.

The results of first aid training are of direct benefit, not only in lessening accidents, but in decreasing the danger of infected wounds, suffering, and death after accidents. Although this training is part of the educational work of the bureau, other organizations and many private concerns are engaged in similar work, and the work is being extended by those who receive the training. First aid at mines was started in England about 1880 and in 1890 the Delaware & Hudson Co., through its physician and surgeon, M. J. Shields, organized a first-aid team in the anthracite field of this State. Since then this work has extended until nearly every large company has its first-aid teams. In 1913, 47 lives were saved by prompt treatment rendered by this efficient agency in the Pennsylvania coal fields.

HOSPITALS

In connection with first-aid, we may well think of the work being done by the hospitals that are now maintained by the State or by various corporations. Mr. Roderick, in his annual report for 1914, in summing up his statements with reference to hospitals at mines, says: "There are 58 hospitals at which during the year treatment was given to 12,153 miners, and 4,774 members of miners' families. Ten of these institutions are supported entirely by the State; 47 by State and contributions from other sources, and one by the Cambria Steel Co. alone. The State appropriation for these hospitals in 1914 was $1,165,284."

EDUCATION

Educating miners to a realization of the dangers to which they are exposed must inevitably aid in reducing accidents. Educational work is being done by mining institutes, vocational schools, and the Y. M. C. A. In addition, a number of the larger mining companies are conducting educational campaigns for the benefit of their employes by publishing and distributing circulars and pamphlets. Particularly worthy of note is the small volume published in 1912 by the Deleware, Lackawanna & Western Railroad Co., and entitled "Mine Accidents and Their Prevention." This publication contains 200 illustrations which show the miner the risks he takes in his daily work, and one of its purposes is to give a knowledge of colloquial English to the non-English-speaking workers.

The Federal Bureau of Mines is conducting its educational campaign by giving instruction in first-aid and rescue work, and by publishing and distributing miners' circulars, technical papers, and bulletins relating to accidents and diseases and their prevention. In some States—I trust their number will increase—the mine inspectors have adopted the plan of appealing directly to the miner through the medium of brief circulars or leaflets.

COOPERATION

Probably the most notable accomplishment of the Bureau of Mines in its efforts to increase safety in mining has been the gaining of the cooperation of all possible agencies in behalf of this movement. The bureau has steadfastly endeavored to enlist the support of all State and Federal agencies already in operation. Further, it has solicited the cooperation of mine operators and representatives of organized labor. It is only one of several agencies working to accomplishe a great end, and whatever results it has obtained have been made possible through the efforts and assistance of the individuals and organizations mentioned.

The fact that large employers of men and persons interested in mine accidents and their prevention are gathered here to take cooperative action leads me to place especial stress on the subject of cooperation. One point that I wish to make is that cooperation to prevent accidents is not always as inclusive as it should be. No one is so vitally interested in accident prevention as the workman himself, yet in many workshops and in many mines throughout the country there is no cooperation among the men to this end. On the other hand, there are establishments where such cooperation prevails, and in these you find the lowest accident rates and the lowest fatality rates. Further, if you will inquire at any factory or mine that is working in a cooperative way with the men you will find there has been an almost startling decrease in the number of fatal accidents.

My plea is that each mining company, and each industrial establishment represented here shall appoint from among the men at its plants a committee or committees on safety, or have the men appoint the committee and organize for safety work.

The appointment of committees of miners to examine conditions in the mines in which they are employed is authorized in Great Britain by the Miners' Act of 1911. I think such provision is part of the mining law of Prussia. At least one large iron-mining company in this country has voluntarily adopted the system.

QUESTION BOX

At a number of establishments it has been the custom for years to maintain a question or suggestion box in which the men are invited to place any suggestion for better or more efficient ways of doing work. I am told that many of the suggestions have been worth thousands of dollars to the plants concerned. Why not make the suggestion box universal and give the men to understand that they are at all times requested not only to make suggestions on efficiency, but also on safety? Employes should be encouraged to point out a dangerous place about a factory or a mine and to suggest a remedy if they have one. Some men are timid about signing their names to such suggestions, fearing that perhaps a foreman or boss will think they are presumptuous. Hence, it is well to allow any man to make a suggestion or suggestions anonymously. The safety committee could discuss these suggestions, and if necessary talk them over with the man making the suggestion if he signed his name, or take them up at some general meeting of the men.

Anyone who has not tried this plan or seen it in operation will be surprised at the value of the suggestions it brings forth, suggestions that might not otherwise be thought of by the men in charge or even by the safety committee itself. The plan illustrates the long-known fact that the thoughts of many men are apt. to be better than the thoughts of one man. You have seen this fact demonstrated in your daily life, in your conference with your office officials, and especially in your business dealings.

A number of the mining companies of the United States have already endeavored to assure the cooperation of their men, not perhaps as much through a suggestion box as through the employment of a safety engineer or inspector who visits frequently all parts of the establishment or mine and confers with the men on improvements that would increase safety.

As one result of its activities the Bureau of Mines is being called on to supply men who can serve as safety inspectors. As the mining industry reaps the benefit, the bureau is glad to supply such men, although it has to train a new man until he is as efficient as his predecessor.

In conclusion permit me to state that whatever you do to decrease accidents, your efforts must be positive and continued. Eternal vigilance is the price of safety as well as of liberty. You must keep up the campaign; you must show the men every day that it is their campaign, that their safety is involved, and that thoughtlessness means suffering and death to them and possibly poverty and want to their families. Even compensation laws, splendid in themselves, do not prevent the taking away of a father from being an irreparable loss to his boys and girls.

Death from accidents will continue. Each industry has hazards that cannot be abolished. But in the United States the death rate from accidents is still inexcusably large. Some statisticians contend that 35,000 workmen are killed in the United States each year while following their occupations and that 2,000,000 are injured. For my part, I firmly believe that the present number of deaths and injuries from accidents could be cut squarely in half in perhaps two years' time were the movement for greater safety to receive throughout the country the attention that it deserves.

To save workmen from injury and death is not only humanitarian (and this alone is sufficient reason for making every possible effort), but also a direct contribution to national efficiency. The impoverishment of the world's supply of trained workmen through the unparalleled slaughter of men in Europe may soon be felt seriously in the United States. This country, in outstripping all others in industrial growth, has had to take yearly many thousands of men from Europe. It is possible immigration will decline greatly, that this country will not be able to obtain the men its industries will require. One result of such a condition will be that the value of a human life will be much greater than ever before. You may call that the economic side. I call it the sordid side. But outside of any such considerations we should, merely as citizens of this great nation, strive continually to do all we can to reduce injuries, suffering, and death from accidents. The work is not one to be delegated exclusively to a State or a Government bureau. It concerns each one of us, and our efforts to improve conditions should be part of our daily life.

DEATHS IN COPPER MINES ARE 3.69 PER 1000 MEN EMPLOYED

Copper mines accidents statictics of the Bureau of Mines are compiled from reports of 585 operators of copper mines employing 44,686 men, of whom 31,265 were employed underground and 13,421 on the surface. Of the 585 operators, 371 were working prospects and small mines in which less than 1,000 days' labor was performed. The other 214 were operators of mines where 1,000 or more days' labor was performed.

The total number of deaths and injuries due to accidents, and the rates per 1,000 employed, are as follows: Deaths, 165, or 3.69 per 1,000 men employed; serious injuries, 2,307, or 45.58 per 1,000; slight injuries, 11,330, or 253.55 per 1,000. Of the total number of fatalities, 147 occurred underground, making the rate per 1,000 employed 4.70. The number of surface fatalities was 18, or 1.34 per 1,000, as statistics of the Bureau of Mines show.

Although the ratios of serious and slight injuries for this group of mines appear exceedingly high, this is not so much due to greater hazards as to the fact that the copper mines are worked by well-organized companies practically all of whom have a safety department in charge of a competent safety engineer. The result is that accurate records are kept, and it is believed that the records shown by both the copper and iron mines of the United States represent more nearly the actual hazard in the mining industry than do the records for any other group. One class of injuries in the copper-mining industry that increases the accident rate is due to the character of the ore handled in the Lake Superior district. Much of the rock in this district contains metallic copper and the men receive many cuts and scratches in handling it.

MAX BALL NAMED FOR BUREAU OF MINES POST

Max Ball, who has been connected for a number of years with the Land Classification Bureau of the U. S. Geological Survey, has accepted a position of Law Examiner in the Bureau of Mines. He will begin his new duties April 1. He succeeds C. B. Dutton.

ON 300-DAY BASIS FATALITIES ARE LESS IN METAL MINES

The majority of the coal-mining States have systematic coal-mine inspection, which tends to reduce the accidents, whereas many of the metal-mining States have no inspection service, says Albert H. Fay, of the Bureau of Mines.

On account of the great disasters that occur in coal mines and the prominence given to them by the newspapers, coal mining is usually considered much more hazardous than metal mining.

Metal mines usually do not claim their death toll in disasters that involve many men, most of the men who die from accidents being killed one at a time. Altogether, there were reported in the metal mines in 1914, 32 accidents in which 2 or more men were killed at one time, making the total thus killed 81, or 14.5 per cent of all the fatalities, as compared with 11.6 per cent in 1913, 12.3 per cent in 1912, and 19.5 per cent in 1911.

Although the fatality rate in metal mines during 1914 was 3.54 per 1,000 men employed, and in coal mines 3.22, yet the comparison is not absolutely fair, for the reason that the metal miners worked 271 days as compared with 207 days for the coal miners. Thus the men in the metal mines were exposed to the mining risk of 64 days longer than were the coal miners. If both rates be reduced to the 300-day basis, the metal-mine fatality rate becomes 3.92 per 1,000 300-day workers in comparison with 1.67 for the coal mines and 2.64 for quarries.

Information has been compiled from official reports of representative foreign countries in which mining is an important industry. The figures show that the fatality rates are lower than those of metal mines in the United States. One reason for the difference is that for many years rigid inspection has been enforced in most of the important foreign mining countries. In the older nations as Great Britain, Germany, and France, the majority of the miners have worked about mines from childhood, as did their fathers and grandfathers before them. Another reason is that in these countries the majority of the miners speak a common language, and there is comparatively little misunderstanding of orders given by mine officials.

In the United States it is not uncommon to find at a large mine men representing 10 or even 20 nationalities, a very large percentage of whom cannot speak English nor understand a language other than their own. An Italian and a Swede may work side by side in a mine under a shift boss who gives his orders in English, a language not understood by either of the two men. In case an accident happens the survivor testifies through an interpreter before the coroner's jury that he thought the orders of the shift boss—not at all what they actually were—were "so and so." A common language is essential to safety in mining.

APPEAL TO PRESIDENT FOR COAL COMMISSION

Letters have been received by the President, Senator O'Gorman and Representative Daniel J. Riordan from 250 real estate, civic and commercial organizations throughout the country. The letter asks that a federal commission be appointed to make a full investigation of the coal situation. It is specified that the methods of coal distribution and the cost to the consumer should be given special attention.

The text of the letter to the President is as follows:

"In consequence of the unsatisfactory condition of the coal situation existing at the present time, and appreciating the serious results that a continuance of same will have upon the consumers of coal, the Real Estate Board of New York, together with the New York Building Managers' Association, and other kindred interests, have been in conference in an endeavor to reach a conclusion as to the best method to pursue to relieve the present condition and to prevent, as far as possible, a recurrence of same in the future.

"It is the consensus of opinion of those in conference that the remedy lies with the authorities at Washington. Therefore, we most respectfully request that a commission be appointed to make a full investigation of the coal situation, in connection with the methods and means of distribution and marketing of coal and its ultimate cost to the consumer. Many of the reasons advanced by distributing agencies for the lack of quality and quantity of supply, merit, in the opinion of the petitioners here, a close investigation of the conditions relating thereto. Irrespective of whether or not a strike occurs, it would be an easy matter for the operators to settle the wage question with the miners and make the consumers pay excessively for same.

"During the strike of 1912 the commission appointed by the President of the United States was successful in bringing the operators and miners into an agreement which expires on April 1, 1916. It is, therefore, respectfully submitted that a similar commission be appointed immediately, that a thorough investigation may be made with the object of preventing a strike, and securing, if possible, the delivery of coal on an equitable basis."

The letters were written after a joint conference committee, appointed by the Real Estate Board of New York and the New York Building Managers' Association, had deliberated for some time on the advisability of taking such action. The members of the committee, all of whom are associated with leading real estate firms in New York City, was made up of W. J. Van Pelt, chairman, of George Reed & Co.; W. L. De Bost of Cruikshank & Co., W. T. Ropes of Horace S. Ely & Co., F. S. Bancroft of Pease & Elliman, and M. D. Littlefield and B. E. Martin.

The committee reported back to the two associations that the situation justified some such action as contemplated, and it was decided to ask every organization in the territory affected, that might be interested, to join the movement.

The following letters were accordingly sent to the presidents of 250 civic and commercial bodies in the cities in which conditions similar to those in New York exist:

"Owing to unsatisfactory coal conditions, a joint conference committee of members of the Real Estate Board of New York and the New York Building Managers' Association has deemed it advisable to investigate this situation promptly. With this purpose in view, we have written letters, as per the enclosed, to the President of the United States, Senators and Congressmen of our respective districts. If you are interested in this matter, we earnestly ask your prompt support by taking similar action. This is a situation which needs united and prompt action to secure results. We are asking allied interests in many sections for like support. Irrespective of a miners' strike (for which, in the final settlement, the consumer will pay the bill), we believe the situation should be promptly investigated to ascertain if coal is delivered to the consumer at a reasonable margin of profit to the following units: Miners, operators, transportation companies and local dealers. If it is found that any of the above units are receiving an unfair return, we respectlly request that action be taken to adjust same at once. It is rumored that the anthracite operators expect to change the sizes of coal delivered. We also believe that the efficiency of this change, as relates to the consumer, should be investigated."

Mr. Van Pelt said that the Merchants' Association of New York City had joined the movement and had sent letters to Washington, asking for the federal commission. He said a reply was expected in a few days.

FRICK COMPANY ORIGINATED SLOGAN OF "SAFETY FIRST"

George S. Rice, chief mining engineer of the Bureau of Mines, in explaining the origin and popularizing of the term "safety first," says: "The term 'safety first' was introduced by the Frick Company, of Pittsburgh, in conjunction with 'safety, the first consideration' and was more or less used around their plant. Whey they purchased certain mines in Illinois the same signs were extended to these mines. Someone out there, I do not know who, changed the phraseology to 'safety first.' So far as we know the Frick people were the first to use this, but it was first publicly used on banners, etc., at the big demonstration conducted on Forbes Field in Pittsburgh, Pa., by the Bureau of Mines in 1911. Since that time the Bureau of Mines has had much to do with popularizing the slogan. I think that there has been rather close connection with Dr. Holmes' efforts and the expression 'safety first,' although we cannot say that Dr. Holmes invented the term."

TONOPAH ENRICHMENT EXTENDS TO A GREAT DEPTH, GEOLOGICAL EVIDENCE SHOWS

Important Study of Great Nevada Camp Made by E. S. Bastin and F. B. Laney of United States Geological Survey—Rich Silver Ores Declared to Be of Primary Origin—Ratio of Gold to Silver Is 1 : 91

Observations of great value to the miners at Tonopah have been made by E. S. Bastin and F. B. Laney, of the U. S. Geological Survey. They made field studies of the district extending over more than a month in the spring of 1915. This was followed by several months of laboratory work upon the ores.

Their investigations were intended to supplement the work of J. E. Spurr and J. A. Burgess on the geology of this district. They are applying to the ore methods of microscopic studies which were not in use by economic geologists at the time the Spurr reports were prepared. These microscopic studies of ores in other districts have proved of material assistance in interpreting the origin of ores.

From the discovery of Tonopah ores in 1900 the importance of the camp has increased year by year until in 1913 its silver production was exceeded only by that of Butte among the other mining camps of the United States. Its metal output since 1904 is shown in the following table compiled by V. C. Heikes, of the Geological Survey:

The copper and lead are from properties closely adjoining the district. The total value of the production for the years tabulated above is nearly seventy million dollars, and dividends have been paid amounting to twenty-one million dollars.

The average ratio of gold to the silver in ounces recovered during this period was about 1 : 91.

The total average value per ton of the ore produced in 1913 was $16.71, and in 1914, $16.84. The largest part of the ore mined is treated by cyanidation, with or without concentration. In certain plants it is stated that ore as low as $8 in assay value under certain circumstances can be treated profitably, according to Mr. Bastin.

A summary of the more important conclusions reached by Messrs. Bastin and Laney are as follows:

(1) Evidence is presented to show that the rich silver ores now being mined at Tonopah are in the main of hypogene or primary origin.

(2) The geologic evidence is favorable to the occurrence of rich primary silver ores to depths considerably greater than those yet attained in the mining operations. Mining has shown, as would be expected, that in certain veins the primary sulphides become less abundant with depth though the same species are present, all veins must of

Ore sold or treated in Tonopah District, Nye Co., Nev., in 1904–1914, number of producers, and total content of gold, silver, copper, and lead

Year	Number of producers	Ore, short tons	Gold value	Silver, fine ounces	Copper, pounds	Lead, pounds	Total value
1904	10	22,703	$386,526	2,119,942	......	......	$1,594,893
1905	12	91,651	1,206,345	5,369,439	......	......	4,449,486
1906	9	106,491	1,304,677	5,697,928	......	......	5,122,289
1907	10	214,608	1,183,628	5,370,891	5,939	195,508	4,739,966
1908	13	273,176	1,624,491	7,172,396	......	......	5,425,861
1909	9	278,743	1,400,361	7,872,967	1,784	1,488	5,494,600
1910	18	365,139	2,303,702	10,422,869	942	6,902	7,932,475
1911	19	404,375	2,366,495	10,868,268	......	......	8,126,677
1912	17	479,421	2,223,878	10,144,987	14	700	8,403,079
1913	32	574,542	2,613,843	11,563,437	1,150	9,001	9,598,733
1914	23	531,278	2,648,833	11,388,452	2,284	924	8,946,987
Increase (+) or decrease (—) in 1914		—43,264	+34,990	—174,985	+1,134	—8,077	—651,746

course have endings. The veins developed by other deep workings are heavily mineralized and of high grade.

(3) Although hot ascending waters are encountered in a number of the deeper workings there is no evidence that these are depositing ores; their chemical composition, in fact, precludes the possibility of such deposition.

(4) The primary or hypogene ores have been modified locally by oxidation and enrichment through the agency of the air and oxygenated solutions of surface or near-surface origin.

(5) There is evidence not only of recent oxidation of the ores, but also of at least one period of ancient oxidation. Supergene sulphide enrichment was probably an accompaniment of each of the periods of oxidation.

(6) The high silver content of much of the ore obtained in the past and of some ore now mined is unquestionably attributable in part to supergene or downward enrichment.

An unusual number of photographs and drawings showing the microscopic characters of the ores were made.

These drawings show that the rich silver minerals were in part deposited at the same time as the commoner sulphides of the ores, but that they also occur as replacements of these sulphides and as depositions along open fractures. Many of the replacements appear to have formed during the primary mineralization, but other replacements and most of the depositions in fractures were probably the result of downward enrichment through the agency of surface waters descending through the lodes.

Analyses of the hot deep waters of the lodes and an analysis of cold acid descending water were made.

MOVES LABORATORIES TO UNIVERSITY OF CALIFORNIA

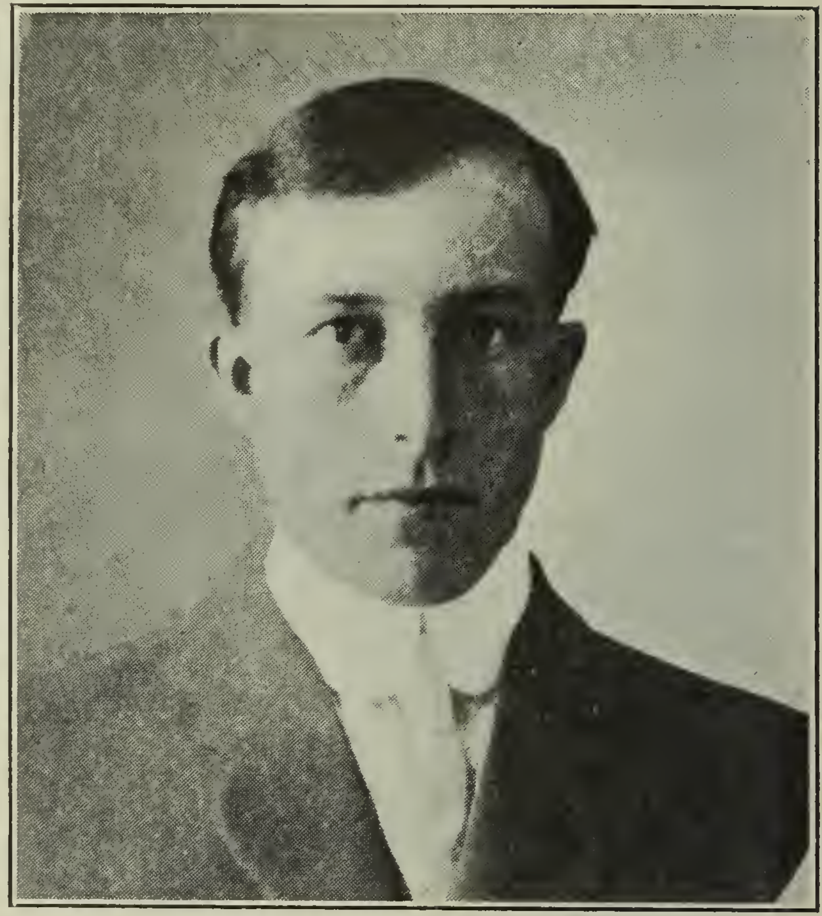
The laboratories of the Bureau of Mines at San Francisco are being moved from the Custom House to the University of California. Arrangements have been made for cooperation between the Bureau and the University which insures the Bureau of more commodious quarters for its laboratory work, and in addition gives it the advantages of the University's equipment.

This change, however, will not affect the work being done by Prof. G. H. Clevenger at Stanford. His investigation on cyanide processes will continue.

CLOSER COOPERATION WITH BUREAU OF MINES LIKELY

Growing out of the cooperation between the Bureau of Mines and the Metal Producers' Association of California and the Nevada Mine Operators' Association, which began at the San Francisco Exposition, a much more comprehensive effort to work together in conducting experiments in cyanide is very likely to result.

GOVERNMENT EXPERTS WELL KNOWN TO MINE OPERATORS



E. S. BASTIN, GEOLOGIST

Dr. E. S. Bastin was born in Chicago in 1878. His early education was in the public schools there and in Philadelphia. He was graduated from the University of Michigan in 1902, and his technical training was received at the University of Chicago, from which institution he received M.S. and Ph.D. degrees.

He began work on the U. S. Geological Survey in 1904. In 1913 and 1914, however, he returned to the University of Chicago where he lectured on Economic Geology. Until 1910 Dr. Bastin was engaged in general geological work in Maine.

His principal published works during that time are: Geology of the Pegmatite Deposit of Maine and folios of the Rockland and Eastport districts. He also collaborated in the work on Penobscot Bay.

He then began work on Economic Geology. In 1910 to 1913 he worked with Dr. Ransome in the Breckenridge district of Colorado. This was followed by a study of Gilpin County and adjacent portions of Boulder and Clearfield counties of Colorado, with J. M. Hill. Since that time he has been engaged in the study of the origin of the rich silver ores and in connection with that study has visited the Ouray Telluride and Red Mountain camps in the San Juan region of Colorado; Aspen, Colorado; Patagonia, Pierce, Wickenburg, Kingman and Chloride in Arizona; Tonopah and Virginia City in Nevada.

Since 1906, in connection with the mineral Colorado; Patagonia, Pierce, Wickenburg, Kingman and Chloride in Arizona; Tonopah and Virginia City in Nevada.

ZINC OPERATORS ARE URGED TO PREPARE FOR RETURN OF NORMAL COMPETITION

Judge W. D. Hoag Points to Increasing Production in Mountain States, Heavy Australian Imports and Possible Mexican Production as Serious Menace to Joplin District Once Present Abnormal Demand Ceases

In a stirring address before the Southwestern Mine Safety and Sanitation Association, at Webb City, Mo., Judge W. D. Hoag urged that the opportunity offered by the present prosperity among zinc miners be seized to place the industry upon a better basis. He believes now is the time to prepare for the keen competition certain to come with the restoration of normal conditions.

The value of the output of our ore the past year went far past the high-water mark of other years. As a result both sheet-ground and soft-ground are in demand. Ore is being produced at a profit and the operator is finding the balance on the right side. As in the days when oil was struck in Pennsylvania, "Everybody had oil on the brain," so now everybody is talking zinc ore. We seem to be on the "high tide" of prosperity.

A number of years ago when Charles Dickens visited this country and conducted one of his reading tours, he was asked to say what he thought of this country, and he said, "Everything is humming, but it is not all hum; everything is coming, but it has not all come."

And so today there is a minor strain in our music. There is a feeling that our business should be on a better basis.

In such times as these it behooves us to stop a moment and inquire what has brought about these conditions. Will they continue?

It is admitted that the present condition is an abnormal one, and when the war closes the demand for our product will be lessened.

AUSTRALIAN ORE

Australian ore has found its way to this country and the capacity of the Pennsylvania smelters is now being taxed to their utmost to treat the present importation.

The high price of zinc ore has stimulated its production in the Mountain States, which lessens the demand for our product. It is fair to presume that this production will continue to a considerable extent.

We have enjoyed a certain "protection" from the importation of Mexican ores of late, due to the internal troubles in that country. We cannot reasonably expect immunity on this ground much longer.

In view of these conditions, what ought we to do?

We are not as those without experience.

THE QUESTION OF TARIFF

In 1908 and 1909 the district unanimously demanded an adequate tariff on the importation of zinc ore. A Congressman was elected on that issue and Congress passed a law providing for a "graduated scale" in the lower grades, but the ore which largely predominates in the Joplin District was protected by a duty of one cent per pound on the metallic contents contained therein. At the incoming of the present administration that law was repealed and we now have only a nominal tariff.

It is not my purpose to discuss the merits of protection, but I believe it to be the consensus of opinion of the operators of this district that a tariff on zinc ore is very important—in fact, necessary, under normal conditions.

The people who need this protection are Republicans and Democrats alike. There should be no politics in this proposition. It should not be made a party measure. Democrats are as desirous of prosperity as are Republicans. There is but one remedy, viz., a non-partisan tariff commission—a commission big enough to ignore popular clamor and treat all interests in a fair and judicial manner—a tribunal that will become as high and as sacred in the minds of the people as are our highest courts; only men of known integrity, of great ability and high character should be selected for such a position. Ample appropriations should be made so that the best engineers, auditors and accountants will get the facts and place them before the commission.

WILL ACCEPT DECISIONS

This district will accept the findings of such a Commission when the facts have been intelligently laid before them.

Under the present system our interests are at the mercy of politicians. Tariff is the football of politics. This subject should be lifted out of that sphere and placed on a business basis.

It must be remembered, however, that Congress is the only power that can "lay and collect taxes, duties, imposts and excises." The commission can only be advisory. However, we can reasonably expect that Congress would be influenced largely by the findings of a commission such as we have considered and would enact laws largely in keeping with its recommendations.

Certainly, it would be a great satisfaction if our operators could state their case to a competent corps of engineers rather than a partisan commission among men of all partisan committee that does not have time for an intelligent consideration of the subject.

There is a growing demand for a nonpartisan commission among men of all parties, especially is this true with business men.

FAVORED BY MINING CONGRESS

The American Mining Congress and the United States Chamber of Commerce, both national organizations, are endeavoring to secure the enactment of a law that provides for such a Commission. This district should aid in the effort. It would be eminently fitting and proper that this work should begin here and now.

The men of this district have always gone to the front when an emergency has arisen.

There is a certain amount of "preparedness" that all successful men must make.

Is not this the time for the men of the Joplin District to begin to "prepare"?

FIFTY THOUSAND LETTERS SHOW PUBLIC'S INTEREST IN MINERALS

Many persons in the United States evidently think of the United States Geological Survey as a great bureau of geologic information, for the Survey answered 50,000 letters of inquiry last year concerning the earth's crust and what it contains. Letters come from all parts of the country at the rate of about a thousand a week, asking the name, source, character, use and value of minerals, and the location of various kinds of rocks suitable for different uses. These letters ask not only about the geology of this country, but also about the rocks and minerals of foreign countries. More and more inquiries for information about our mineral resources are coming from South and Central America. The representative of one foreign country wanted to know where to get a large supply of coal of a particular grade, and a purchaser from another country wanted to place an order for monthly shipments of several hundred tons of lime.

The Survey is in close touch with the 90,000 producers of minerals in the United States, and is ready to answer questions about the annual production of 70 different minerals or mineral products. Furthermore, the Survey knows the places in the United States where more than 425 different minerals may be found, so that it is in a position to act as the public agency in bringing the mineral producer and consumer into touch with each other.

Federal law prohibits the Survey from making special examinations, such as assays and analyses for private individuals, but the geologists can make simple mineral determinations and give information as to the identity and use of minerals submitted. It is an everyday occurrence for the Survey to answer many such questions as these: "What is this mineral, and if it is of value, where can I find a purchaser?" "Where can I get a supply of sand in my own State that will analyze 97 per cent silica?" "Where does platinum occur?" "In what geologic relations is manganese ore found?" By answering the many and miscellaneous inquiries for geologic information the Survey is becoming increasingly valuable to the public.

Many an inquiring citizen is referred to his own State survey for more detailed information, for many people do not know that they have in their own State an officer or organization ready to answer questions about the geology and mineral resources of the State. There are now 41 State geologists, or equivalent State officials, many of them working in cooperation with the Federal Survey.

MAMMOTH COPPER COMPANY EMPLOYS SAFETY ENGINEER

John Herschel East, Jr., of the United States Bureau of Mines, has accepted a position with the Mammoth Copper Company and will take entire charge of the safety work at the company's big copper mines at Kennett, Shasta County, Cal.

This is the first appointment of a safety expert from the Bureau of Mines to be made by any of the California mine operators, and is looked upon by the advocates of mine safety as an auspicious bit of news.

East has been with the demonstration car of the Bureau of Mines in Michigan. There are about 1,500 men employed at the Mammoth mine, about 600 of whom work underground.

Edwin Higgins, chief mine inspector for California, has returned from an inspection tour of the mines in the Mother Lode district, and reports that he is more than pleased with the way in which the mine operators have accepted the new safety laws which went into effect the first of this year.

"Everywhere I found the attitude of the operators to be that of cooperation," Mr. Higgins is quoted as saying. "We don't expect to revolutionize the situation overnight, and I was agreeably surprised at the progress that has already been made by the operators in conforming to the new laws.

"Two cooperative stations are to be established in the Mother Lode district, one at Jamestown and the other at Sutter Creek, where all the equipment for rescue work will be assembled and held in readiness for instant call."

NEVADA CHEMICAL COMPANY TAKES OVER POTASH CONCERNS

The Nevada Chemical Company, a Nevada corporation, has been organized to take over all potash matters with which Victor Barndt is concerned. The authorized capital is $1,000,000. In its contemplated activities the Nevada Chemical Company will be allied with important interests in the chemical, alkali and fertilizer trades. Adequate financial support is assured, it is said.

ROCK-DUST METHOD OF RENDERING COAL DUST INERT MEETS GENERAL FAVOR

Bureau of Mines is Trying to Interest Machinery Manufacturers in Epuipment for Applying Rock Dust in Coal Mines—Cost an Important Feature in This Effective Safeguard Against the Initiation of Mine Explosions

The Federal Bureau of Mines has made a large number of explosion experiments at the experimental mine at Experiment, Pa., to determine the efficiency of rock dust in preventing the initiation of mine explosions and in checking them after they have been initiated. The proportion of shale dust to coal dust required, to prevent or check explosions has been determined for coal dust from many seams.

The rock-dust method seemed to have such an advantage over watering methods in which water is applied infrequently, in that more constant protection is afforded, that arrangements were made with a coal company in the Pittsburgh district to rock-dust a part of one of their mines and keep accurate account of the costs. Bureau engineers inspected the rock-dusted zones from time to time and took samples to insure that the zones were in safe condition. This work was continued for a year, the entries being redusted from time to time as the occasion required. The test has been so satisfactory that the dusting has been extended to three other mines, and conferences have been held with officials of other companies for the purpose of explaining results with the view to adopting the method. Considerable interest has also been shown in other parts of the country, particularly in Colorado, where rock-dusting has been carried on in the Delagua mine of the Victor American Fuel Co for more than four years. The probable wide adoption of this method of rendering coal dust inert, therefore, makes desirable the development of suitable machinery both for preparing the dust and for distributing it

SIZE OF MATERIAL

The first rock dust that was used in the Pittsburgh district was pulverized limestone dust of such fineness that about seventy-five per cent would pass through a 100-mesh sieve This material was very satisfactory, but a coarser material would be easier and cheaper to prepare, therefore explosion tests were made in the experimental mine to determine the relative efficiency of fine and coarse material It was found that material prepared by grinding in a hammer crusher equipped with a one-sixteenth-inch slotted screen, was only a little less efficient than the pulverized dust It is believed that suitable equipment to furnish such dust can be obtained at a low cost

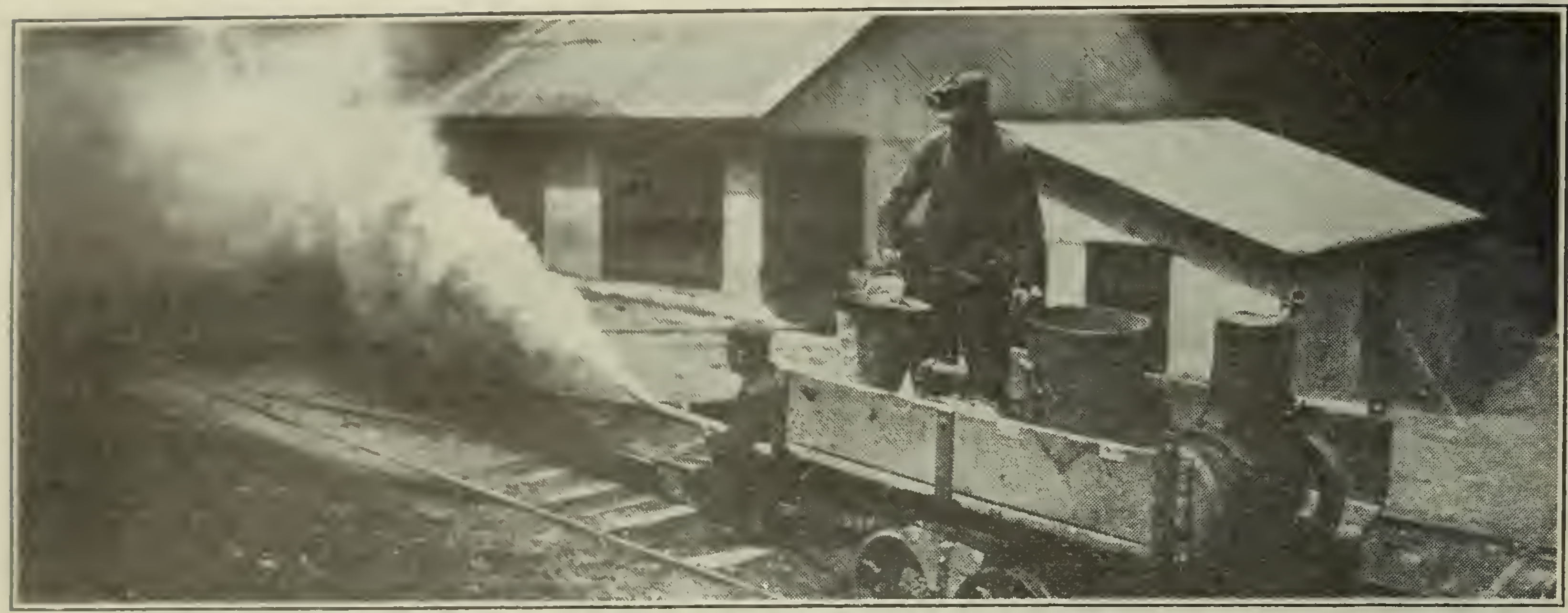
In rock-dusting a mine entry, the best way to apply the first coating is, under most conditions, to throw the dust on by hand, because a thicker and better distributed coat is obtained. In time, coal dust settles on the rock duct, and redusting is desirable This is best done by a rock-dusting machine, which blows into the air current a cloud of rock dust that settles in a mantle over the coal dust. The use of a machine decreases the cost and increases greatly the convenience of redusting Such a machine, as used at the experimental mine and similar to one in use at Delagua, Col., is shown in operation in the accompanying photograph

In order to stimulate interest in the development of suitable machinery for use in connection with the rock-dust method of rendering coal dust inert, the Director of the Bureau of Mines is addressing the crusher and blower manufacturers as follows:

"As the result of mine-explosion experiments at the experimental mine and explosion-prevention investigations in the field, the bureau is strongly recommending the use of finely crushed, or pulverized rock dust, having no or a very small percentage of combustible matter, as a preventive for coal-mine explosions.

"Nearly all mine explosions in bituminous coal mines, once initiated, are extended by the fine coal dust that is found on the surface of most mine entries This dust, when blown into a cloud, is very explosive. If rock dust is thrown on the surfaces, it covers the coal dust or becomes mixed with it, and if sufficient is used the cloud of dust blown from such surfaces in the event of an explosion is nonexplosive and quenches the flame The more finely divided the dust is, the better it is for rock-dusting Tests have indicated however, that a dust all of which will pass through a one-sixteenth-inch slotted screen, and having about 40 per cent through 100-mesh and 25 to 30 per cent through 200-mesh screen, is satisfactory for the purpose. Further detailed information concerning the use of rock dust in mines can be obtained from Bureau of Mines Technical Paper 84, a copy of which I am sending under separate cover.

"A number of mines in Pennsylvania and Colorado are now using the rock-dust method of rendering coal dust inert and its



BUREAU OF MINES PHOTOGRAPH

Rock-dusing machine in operation.

installation in a large number of other mines is being considered.

"At the present time many of these mines are purchasing limestone or other rock dust for this purpose, but, in order to make the method as cheap as possible, it is desirable in many cases that the dust be ground either at the mine where it is used or at some conveniently situated central point for a group of mines.

"The bureau desires to inform you of this new field for crushing or pulverizing machinery. Information as to whether your company now has machines, which will furnish material as fine or finer than that given above, the output per hour, horsepower required and cost will be appreciated."

To blower manufacturers:

"It is desired to call your attention to the demand which has arisen in connection with the work of prevention of coal-dust explosions in mines for a machine designed to blow a cloud of rock dust. This will probably be of interest to you, as a positive blower is one of the essential parts of the apparatus.

"One of the methods now strongly recommended by the Bureau of Mines for the prevention of coal-dust explosions is to coat the mine entry surfaces with rock dust so that in the event of an explosion, a thick rock-dust cloud will be formed and quench the flame. The first coating of rock dust is thrown on the mine entry surfaces by hand. After a time, some coal dust settles on the rock dust and it becomes desirable to apply another coating of rock dust; this is prabably most conveniently done by the use of the rock-dusting machine. It blows a thick cloud of dust into the air current which carries it for long distances, the dust gradually settling out and forming a mantle over the coal-dust deposits.

"The apparatus, as used at the experimental mine of the Bureau of Mines, consists of a small positive blower, the air from which passes through a 2-inch pipe to the injector chamber, into which the rock dust is fed from a hopper; the air and dust, becoming mixed in this chamber, is blown through a hose into the atmosphere.

"The attached blueprint shows an outline arrangement of the apparatus. The blower used has a volume of about 288 cubic inches and is run at about 1,000 R.P.M.; the pressure in the outlet pipe when the machine is operating is about two pounds per square inch.

"The injector chamber should be carefully constructed. The 2-inch air inlet is reduced to a nozzle of 1-inch opening and the nozzle should extend far enough into the chamber of the 3-inch tee, so that the nozzle opening is below the outer edge of the dust-hopper opening. The dust then falls or is drawn forward into the air stream and is blown through the hose. A flexible hose is desirable for an outlet so that the air stream can be pointed in any direction; also this permits its connection to pipes through stoppings to direct the dust stream into air courses or entries having no track and which ordinarily receive no treatment to render the coal dust present inert.

"The power to drive the rock-dusting machine is furnished by a small gasoline engine in the experimental mine apparatus, but should be furnished for use in dusty mines by a small totally inclosed electric motor or other equipment complying with approved safety standards.

"As the rock-dusting method of rendering coal dust inert is now being taken up actively, it is believed that there will be a considerable demand for such apparatus. Information as to whether your company could furnish such equipment and the approximate cost of the same would be appreciated."

NEW STATISTICS TO COVER DATA REGARDING CONSUMPTION OF COAL

Geological Survey Takes Steps to Meet Demand for this Class of Information—Question of Markets More Valuable than Question of Source of Supply—Movement of Coal from Mine to Point of Ultimate Consumption Will Be Shown

The demand for statistics covering the consumption of coal is so great that the U. S. Geological Survey has decided to furnish them. These figures are more in demand than production figures, although, of course, the former cannot be compiled unless the latter be obtained. Consumption statistics show essentially markets, and in the present day the condition of the coal industry is such that the question of markets is of more vital interest than the question of source. It is believed that the figures which will be obtained, although possibly not showing the disposition of 100 per cent of the product, will be so nearly complete as to warrant their unreserved presentation.

The Survey is now engaged in collecting 1915 figures showing the quantity of coal from each producing area which is consumed in each State. Over 1,000 inquiries have been sent out to selling agents and shippers, asking for details regarding the source and destination of the coal handled by them, and the figures obtained in this way will be supplemented by other information along these lines already available to the Survey. The aim of these statistics, which are supplementary to the figures of production now collected and published by this Government Bureau, is to show the movement of coal from the field where it is mined to all of the consuming districts.

Prominent men in the coal trade with whom C. E. Lesher, who has charge of the investigation for the Geological Survey, has conferred, state that the figures will be of great value, particularly in rate investigations.

In commenting on the new consumption statistics a prominent anthracite man says:

"As there are relatively few producers of anthracite as compared with the number of distributors and consumers, I suppose it might be assumed that there are more persons interested in the consumption than in the production, but you must consider also that all of these persons are interested keenly in the supply and source of their fuel. This particularly manifests itself at the present time when interruptions to that supply are being experienced through lack of car supply, and when apprehension is felt in some circles that there may be some trouble at the source, if the wage negotiations fail of result."

RADIUM METAL HAS BEEN ISOLATED ONLY TWICE

Radium is a metal and is described as having a white metallic luster. It has been isolated only twice. Radium is ordinarily obtained from its ores in the form of hydrous sulphate, chloride or bromide, and it is in the form of these salts that it is usually sold and used. These are all white or nearly white substances, whose appearance is no more remarkable than that of common salt or baking powder.

Radium is found in nature in such exceedingly small quantities that it is never visible even when the material is examined with a microscope. Ordinary radium ore carries only a small fraction of a grain per ton of material and radium will never be found in large quantity, because it is formed by the decay of uranium, a process which is wonderfully slow, and radium itself decays and changes to other elements so rapidly that it is impossible for it to accumulate naturally in visible masses.

Minerals which carry radium are fairly easy to determine. Pitchblende, as generally found, is a black mineral about as heavy as ordinary iron, but much softer. The principal radium mineral, carnotite, has a bright canary yellow color, and is generally powdery. There are other radium-bearing minerals of less importance.

ASSOCIATED GEOLOGISTS OPEN A NEW YORK CITY OFFICE

The Managing Geologists of the Associated Geological Engineers announce the opening of a New York office at 3112 Equitable Building, 120 Broadway, in charge of Frederick G. Clapp, Managing Geologist of Petroleum Division. They will continue the practice of Geological Engineering in all its branches, with special reference to examinations and reports on oil and gas properties.

The present staff of geologists and engineers will be maintained, with additional equipment and facilities.

The Managing Geologists and their associates desire at this time to express to their clients an appreciation of the confidence and patronage so liberally accorded in the past.

ZINC OUTPUT OF NORTHERN ARKANSAS LIKELY TO DOUBLE THIS YEAR

Carbonate Ore Being Extracted From Scores of Small Properties—Railroad Being Built From Rush Creek to Yellville Will End Troublesome Transportation Problem—Four Ore-Buying Companies Operating in District

With the advance in zinc prices great prosperity has come to Marion, Boone, Newton, Searcey and Orange Counties, in Northern Arkansas. The mining of zinc carbonates in this region has resulted in the greatest activity. For the most part work is being done by small operators. Some of the ore is being removed from open cuts and a great deal is available from short tunnels.

Reports reaching Washington indicate that mining in this portion of Arkansas during the first three months of 1916 shows a remarkable increase over the same period of 1915.

The livest camp is Rush Creek, which is twelve miles southwest of Yellville. A narrow-gauge railroad is being built from Rush Creek to Yellville. This railroad will remove the principal drawback to mining in this territory. The lack of transportation facilities has been such as to make a cost of $3 a ton necessary to get the concentrates to the railroad. At times the condition of the wagon roads has been so bad as to make it absolutely impossible to ship ore.

Another great advantage that will come with the completion of the railroad will be the possibility of introducing coal and oil for fuel at the smelting plants. Wood has been the fuel used in the past and at times it was more difficult to get fuel than ore.

In September, 1914, there were less than 100 people in Rush Creek. The town has now fully 1,000 inhabitants, it is reported.

From all appearances the output of zinc in Arkansas will double in 1916. There was one mill in operation in Arkansas in 1914; ten in 1915, and seven mills are now building or have just been completed. Formerly there was only one company buying ores in this part of the zinc belt. Now there are four companies bidding for the carbonate.

General prosperity has resulted in great improvements in roads and is making possible important experiments in the use of important metallurgical processes.

The mining of zinc in Arkansas received a severe setback in 1907. A boom at that time resulted in financing a considerable number of properties. In many cases poor judgment was used and expensive surface improvements were made before the value of the deposits had been determined. High overhead charge made profits impossible. As a result these failures gave the industry a bad name in that section and very effectually shut out additional capital. The increasing demand for zinc, however, lead to further development of mines on these properties and it has proven that they are much more valuable than it was formerly thought.

Bureau of Mines Publications

The Bureau of Mines will have ready for distribution April 1 the following publications:

Bulletin 86. Some engineering problems of the Panama Canal in their relation to geology and topography, by Donald F. MacDonald. 1915. 86 pp., 29 pls., 9 figs.

Bulletin 89. Economic methods of utilizing Western lignites, by E. J. Babcock. 1915. 74 pp., 5 pls., 5 figs.

Bulletin 114. The manufacture of gasoline and benzene-toluene from petroleum and hydrocarbons. 1915. 268 pp., 9 pls., 45 figs.

Technical Paper 93. Graphic studies of ultimate analyses of coals, by Oliver C. Ralston, with a preface by Horace C. Porter. 1915. 41 pp., 3 pls., 6 figs.

Technical Paper 129. Metal-mine accidents in the United States during the calendar year 1914, compiled by Albert H. Fay. 1915. 96 pp., 3 figs.

Miners' Circular 20. How a miner can avoid some dangerous diseases, by A. J. Lanza and Joseph H. White. 1915. 24 pp., 4 figs.

LITERATURE ON FLOTATION PROCESS IS ABSTRACTED

Officials at the Bureau of Mines are finding the bibliography on concentration of ores by flotation, issued recently by the School of Mining and Metallurgy of Missouri, a most useful publication. It is a compilation of all articles on flotation and contains a very convenient index to literature on this subject, and in addition abstracts on all patents applying to flotation are given.

Dorsey A. Lyons, who is in charge of cooperative work being done by the Bureau of Mines and the Missouri School, is planning regular supplements to this publication, which will keep it up to date.

THE
MINING CONGRESS
JOURNAL

PUBLISHED EACH MONTH BY
THE AMERICAN MINING CONGRESS.
Munsey Building. Washington, D. C.

Subscription Rate, per year............. $2 00
Single Copies........................... .20

Entered as Second Class Matter January 30, 1915, at the Postoffice at Washington, D. C.

APRIL, 1916

EDITORIALS

GASOLINE AND COAL PRICES—A COMPARISON

The price of gasoline has doubled in the last six months and predictions are plentiful that its price will continue to advance. This is accounted for by Secretary of the Interior Lane by—

> (a) Increased consumption of gasoline within the United States. Various trade journals estimate that the consumption of gasoline in the United States during 1915 was 25 per cent greater than in 1914, and that there will be a like increase in 1916.
>
> (b) Increase in exports.
>
> (c) The depletion of gasoline stocks due to increased domestic and export demands. On January 1, 1915, refiners had stocks of gasoline in storage amounting to at least 2,000,000 barrels. Inquiry today indicates that there is little gasoline in storage.
>
> (d) Decreased production of crude containing a large percentage of gasoline, as in the Cushing pool of Oklahoma, the daily production of which declined from more than 300,000 barrels in April, 1915, to less than 100,000 barrels in January, 1916. The decline in the Cushing pool was partially compensated for by an increased production of crude from other pools, the gasoline content of which production, however, was from 5 to 7 per cent less than that of the Cushing crude.

The following table is given, the totals of domestic consumption being found by deducting the amount exported from the amount produced:

	Production	Exported	Difference
1899 ..	6,680,000	297,000	6,383,000
1904 ..	6,920,000	594,000	6,326,000
1909 ..	12,900,000	1,640,000	11,260,000
1914 ..	34,915,000	5,000,000	29,915,000
1915 ..	41,600,000	6,500,000	35,100,000

No difficulty has been experienced in purchasing sufficient gasoline to meet requirements, and yet the price has advanced 100 per cent. It is difficult to find satisfaction in a comparison of the prices for coal and gasoline when contrasting the two branches of the industry.

The price of coal has made a small increase but the cost of machinery and supplies has materially increased and the labor cost has been increased by a 5 per cent increase in wages, wherein lies the difference?

Are oil producers wise and coal producers otherwise?

Gasoline, for the most part, is a luxury. Coal is always and only a necessity. Does the public yield willingly for luxury and grudgingly for necessity? Or does it yield when it must and only when it must.

Bituminous coal operators had no difficulty in demonstrating that they could not pay an increase in wages, but they did, and were apparently relieved that the increase was no more.

The public can pay the operator a few cents more for his coal, under the same stress which induced the operators to agree to the recent advance in wages. Gasoline has generally been sold at a profit; bituminous coal has not. Coal consumers can be made to pay a price which would double the amount received by the producer with no greater protest than was made by gasoline users. That would not be right nor fair, nor is it right or fair, that the coal producer should sell at present prices.

The bituminous coal producers of the country, as a whole, should receive from fifteen to twenty-five cents per ton more for coal than the average price for the last six years based on past production costs. With increased costs for labor and supplies the twenty-five cents per ton increase will not more than put the industry on a fairly paying basis.

It is a startling anomoly that the producers of a necessity shall continue to operate at a loss. If they were wise they would devise a remedy for conditions generally regarded as intolerable.

BUREAU OF MINES SHOULD CONTINUE ITS SAFETY WORK

Here are the more important reasons why House Bill 153 should be so amended as not to interfere with the work now being done by the Bureau of Mines. The bill would place a portion of the work now being done by the Bureau of Mines under the jurisdiction of the Department of Labor.

The first thing to be considered is the reduction of accidents, which is the purpose of the bill under consideration. The record of reduction in loss of life in mining operations since 1907, when the first appropriation of $150,000 was made "for conducting such investigations as would increase safety and efficiency in mining," is remarkable.

These good results have been obtained by a practically perfect cooperation between mine operators and workers, each of whom has full confidence and respect in the work of the Bureau of Mines. To take the control of this work from that Bureau might easily destroy this relationship of confidence and cooperation, which we believe to be ababsolutely essential to the best results.

The bill as it passed the House apparently leaves both the Bureau of Mines and the proposed Bureau of Labor Safety with authority to make the investigations, but when taken in connection with the wording of an appropriation for the Bureau of Mines to the general effect that the money appropriated shall not be used to perform any work which any other bureau is authorized to do, would probably prevent the Bureau of Mines from any activity in this behalf, leaving all of this work to be done by the proposed Bureau of Labor Safety.

It is particularly desirable that there shall be no duplication of this safety work, and it would be unfortunate to have this legislation appear to leave any doubt as to which of these bureaus should make the investigations looking to better conditions in the mines of the country.

The American Mining Congress believes the following amendment would meet the situation:

> "except that investigations and examinations of labor safety plans and devices, and the study of devices and methods for the prevention of diseases, in the mining, quarrying, metallurgical, and other mineral industries, shall be made by the Bureau of Mines, as required by existing law."

Thus amended, the bill will not interfere with the splendid work which the Bureau of Mines has been and is doing for the benefit of the underground toiler in the mines of the country.

MINING DESERVES MORE AID FROM GOVERNMENT

The following official statement given out recently by the Arizona State Bureau of Mines is a concise rendering of one of the gospels which the American Mining Congress is trying to teach:

"There is a great necessity for men engaged in the mining industry to be more familiar with political affars, especially conditions in Washington and in their State capitals, is the statement recently made in a bulletin of the Arizona State Bureau of Mines. That this has not been the case is in no small degree responsible for the unfair distribution of government funds regarding mining and agriculture.

"Agriculture and mining are the two backbone industries of the country, and each deserves fostering by the federal and State governments. More money could profitably be spent in the agricultural development of the country and more undoubtedly will be spent; it is quite probable that in a few years the size of agricultural appropriations will have doubled their present size.

"The same is true of mining. The mines in the country as a whole produce almost as much new wealth as agriculture, and in many States, such as Arizona, the mines produce annually as much as the total value of all farm land, improvements and products. If anything, mining should receive more aid from the government than is given to agriculture, as it is more scientific, and results are obtained only after long and expensive experimentation. Moreover, that which is taken from mines is removed forever, and there is no opportunity of correcting mistakes, whereas on a farm a mistake in one year's crop may be corrected in the next.

"Mining is not receiving its fair proportion of government and State appropriations, and it is largely the fault of those in the mining industry, for they have not given the coordinate action of the persistent type which the farmers have. Cooperation and organization will be the means by which the miner will receive his share of attention."

COUNTRY TO HAVE CHANCE TO SEE SAFETY-FIRST SHOW

We do not want to take to ourselves any undue credit, but we are very pleased to announce that the safety-first train, which we urged editorially in our last issue, is an accomplished fact. It may have been that the advantages to be gained were as apparent to the government officials as they were to us. At any rate the country is to have a chance to see the safety-first exhibits which attracted so much attention in Washington.

It will pay any person interested in increased efficiency in the proper safeguarding of human life to visit this train if it comes to your city.

SAFETY FIRST AND THE MINERS' UNION

We call especial attention to an article from the pen of Mr. S. A. Driver appearing elsewhere in the issue under the title "Thoughts on Mining Legislation."

The paper carries a number of statements which will be questioned and which are vitally important. THE MINING CONGRESS JOURNAL opens its columns for a concise discussion of this general subject.

Are the following statements true and if true what is the remedy?

"Of the laws which regulate coal mining which apply to the safety of the miner nearly all are aimed at the operator; the liability and duty of the miner to himself and his fellow workmen is overlooked."

"Of every one hundred men killed under ground, a little more than fifty-two are killed by falls of roof and coal. Only a small number of these accidents were unavoidable; nearly all could have been prevented by the exercise of ordinary skill and care and a few moments' labor by the miner by the setting of one prop."

. . . . . .

"The U. M. W. of A. is opposed to any increase of individual responsibility or efficiency. . . . This union has in this country and in England opposed every suggestion for the safety of the miner which involved any extra labor or time on his part. It has resisted the operation of every safety practice the burden and expense of which did not rest on the operator."

. . . . . .

"To attain a reduction of this high death rate, so earnestly desired by operators and mining engineers, we must reach the man at the face; if this cannot be done by education, then by legislation."

The American Mining Congress has felt much satisfaction in the efforts which have been made in the past looking to greater safety in mining operations. It is proud of the record which appeared in the March issue of the Journal.

It believes in publicity and discussion as the most efficient means through which to advance this cause.

We shall hope for an active discussion of the idea presented.

THE LEASING BILLS

For years the American Mining Congress has been contending against the proposed federal leasing system as it applies to the mineral resources of the west. It has urged that such a system will restrict a development; will foster monopoly in the hands of those who had acquired fuel and power resources under the old law; will make difficult the ability of the Rocky Mountain States to live up to their obligations to maintain republican forms of government by keeping beyond the reach of the taxing power a very large part of the property which must be protected and which should pay its just share of the expenses of government, and will exact tribute from these resources in the form of royalties, which is not exacted from the older states.

These and many other reasons have been reiterated and many efforts have been made to unite the west upon some construction policy which would prevent these results.

During these years these resources have been locked up by the withdrawal orders at first issued by the President without lawful authority and afterward legalized by act of Congress. No development was or is possible until some change is made. Few people believe that the defeat of these bills will accomplish anything further than to continue the present stagnation. Nine-tenths of the nation believes that the Federal mismanagement which was responsible for the abuses of the old law can only be remedied by federal management of another kind and under a law based on radically different principles. All agree that the old abuses should not be repeated. The East has devised and is now insisting on the enactment of laws embodying the leasing principle. The West opposes but offers no constructive substitute. The secretary of the American Mining Congress has been outspoken in his opposition to all federal leasing bills. He has not changed his belief as to the injustice and the inexpediency of such legislation. He has frequently urged the governors and commercal bodies of the western states to get together and devise some comprehensive plan to meet this situation.

Two such conventions have been held. The Public Lands Convention, called by the then Governor of Colorado (now U. S. Senator) John F. Shafroth by authority of an act of the Colorado State Legislature, was held at Denver in 1911. A three days' session developed many protests, but no plan of action. In 1915 a conference of governors and their special representatives met at Portland in September.

This session also developed many protests and by a vote of twenty-nine to seven reaffirmed the opposition of the West to the leasing system, but developed no construction plan in that behalf.

If six years of appeal for a construction policy have been without result is it probable that another six years will be more effective? Shall we continue appealing to deaf ears for help, while western development is being strangled, or shall we lend our aid in making the proposed legislation as tolerable as possible? Demonstrations that this legislation as bad as the West believes will justify its repeal, and if experience is to be relied on this will happen before the West has been able to agree upon a fairly constructive substitute.

What should be the position of the Mining Congress?

What do you think about it? A prompt response from our Western members will be welcomed.

CHANGES OF GEOGRAPHIC NAMES CAUSE PROTESTS

Considerable complaint is being heard in Washington with regard to changes being made in names of localities by the Board of Geographic Names. A number of names have been changed in Alaska recently, which has resulted in considerable complaint from residents there.

Many maintain that the people have a right to name the landmarks of their own locality and that these names should not be arbitrarily changed by a board in Washington.

Mineral Land Decisions

The Wasatch Mines Company of Salt Lake City has lost is appeal from the General Land Office.

This is an appeal from a decision of the Commissioner of the General Land Office dated September 22, 1915, holding for cancellation, because the area has been already patented, mineral entry 013291 for the Emma Copper lode claim, survey 5940, situate in Sec. 32, T. 2 S., R. 3 E., S. B. M., Salt Lake City land district, Utah.

This is a case in which the entire area applied for is embraced within the theoretical limits of the patented Highland Chief claim. The Highland Chief claim, survey 81, is represented upon the plat of survey 5940 in two positions. In its position as actually marked, defined and established upon the ground, it is to the north of and entirely outside of the limits of the Emma copper claim here applied for, while in its position as represented upon the plat and described in the field notes of survey 81, it lies wholly within the limits of the Emma copper claim. It further appears that the total area of said Highland Chief claim, as represented by survey 81 and lying within the limits of the Emma copper claim, is entirely covered by other mining claims heretofore patented, which have expressed exclusions of the supposed conflict with said Highland Chief claim. It now appears as a matter of fact that there was no such conflict. The attempted exclusion by those patented claims of this area was therefore without force and effect and the area passed to said claims under their patents.

It is urged in the appeal that the prior patented claims referred to excluded certain specific areas or tracts which may be identified by a reference to the field notes of the surveys of said claims and that these areas remained public lands of the United States subject to appropriation under the mining law. With this the Department does not agree. In the case of United States Mining Company *vs.* Wall (39 L. D., 546), in which there was a situation similar to the one here presented, it was said:

> "As far as either or all of the surveys are concerned the position of each claim and their relative positions must be determined as the claims are defined and established upon the ground, and all errors of description of the position of either claim and of the conflicts between them, must give way thereto in accordance with the rule in the case of Sinnott *vs.* Jewett (33 L. D., 91). Indeed, it is plainly evident that it was the intention in this case to exclude from the Northern Light claim the actual, and not a theoretical, conflict with the Grizzly."

Upon motion for rehearing in the case above cited, the Department on March 24, 1913, ordered a hearing for the purpose of permitting the protestant company to establish *prima facie* that the amended survey of the Grizzly is coincident and identical with and covers the same tract of ground as was included in and delimited by, the original survey of that claim. It was not, however, the purpose or effect of the decision to overrule the principle laid down in the decision rendered upon appeal. This is indicated by the following expression:

> "It is further contended that the exclusion made in the Northern Light patent is of a tract described by metes and bounds, referable primarily to the lines of that claim alone. With this contention the Department is not prepared to agree. It may be noted that only three points of intersection out of four are given or mentioned either in the patent or in the field notes of the Northern Light survey, and further, that the parallelism of the side lines of the excluded Grizzly claim is not recited or mentioned. On the contrary, the Department is inclined to the view that the situs of the conflict is established and controlled by the loci of the respective conflicting claims as such claims are fixed and determined by their monuments and lines upon the ground and that it is this conflict that was excepted and excluded from the Northern Light patent."

Therefore, the Department holds, since it appears in this case that the total area applied for is represented by the sum of certain expressed exclusions of supposed conflicts with the Highland Chief claim, which conflicts it now appears have no existence in fact, it must be held that the areas represented by these theoretical exclusions passed under the patents to the claims referred to and that there now remains no area subject to appropriation within survey No. 5940 of the Emma copper claim.

The decision appealed from accordingly was affirmed.

PLACER CLAIM DAMAGE

The Secretary of the Interior has made the following decision in the claim for damages filed by Mrs. E. C. Kinney for the flooding of certain placer claims by the Reclamation Service in the Minidoke reclamation project in Idaho. The decision in brief is as follows:

"The mining claim as to which the claimant was in default in the performance of annual assessment work at the date of withdrawal for the construction of irrigation works under the reclamation act does not except the land from the force and effect of the withdrawal."

This decision modifies the decision made previously by the Reclamation Service and by the department.

The department reaches the conclusion that the claimant failed to comply with the requirements of the general mineral laws as to certain property, particularly with reference to the performance of the assessment work. Under the circumstances pertaining to these claims she is not entitled to receive any reward, it is held.

In another of the claims, however, it appears that the annual assessment work was performed as required by law up to the time the land was flooded, and that there were certain improvements made on the claim. At the time of taking over the land the United States found that a portion of the improvements had been removed and the balance had greatly deteriorated in value. The department agrees that the payment of damages on that property in the amount of $1,000 is justified, but on other claims the damage claims were rejected.

REPAYMENT OF EXCESS

An appeal from the decision of the General Land Office by William McGinley in connection with his coal land entry in the Montrose, Colo., land district, has been decided by the department as follows:

"Where the purchaser of coal lands paid the appraised value thereon as required by the departmental regulations, he is not entitled to repayment of any excess paid by him over and above the minimum price fixd by Section 2347, Revised Statutes."

REFUSES TO LEASE

The decision in the matter of applications for lease on Colorado oil lands presented by Paul Lovell, of Marietta, Ohio, by James H. Causey, Denver, and by James B. Shepard, of Denver, the following decision has been reached:

"In the absence of specific legislation provided therefor, the Secretary of the Interior is without authority to enter into or make leases covering public oil and gas lands."

The form of lease sought was essentially similar to that which was used in connection with the leasing of coal and gas lands belonging to certain Indians in the State of Oklahoma.

The question of leasing oil and gas lands and other non-metalliferous mineral deposits upon the public domain has received considerable study and consideration in the Interior Department. It has been concluded that as the law now stands there is no authority to enter into such leases.

In a bill introduced in the House of Representatives by the second session of the Sixty-third Congress were embodied provisions specifically authorizing the Secretary of the Interior to grant prospecting permits and leases upon coal and gas-bearing lands. Like provisions are contained in H. R. 406, which is pending before the Senate.

NORTHERN PACIFIC CASES

In a series of cases appealed from the General Land Office by the Northern Pacific Railroad Company the following decisions have been handed down:

1. Where the lands selected as indemnity by the Northern Pacific Railroad Company are, prior to the approval of the selection, withdrawn as coal, the company will be required to elect to take patent for the land with reservation of the coal, under Act March 3, 1909, or apply for a hearing to determine whether or not the land is in fact coal in character.
2. Where selection was made by the Northern Pacific Railroad Company prior to the Act of June 22, 1910, the lands theretofore withdrawn as coal, the company will be required to take patent for the land with reservation of the coal, under provision of that act, or apply for a hearing to determine whether or not the land is in fact coal in character.
3. Lands embraced in the coal-land withdrawal made under act of June 25, 1910, are not in effect with the provision of act of June 22, 1910, subject to indemnity selection by the Northern Pacific Railroad Company.
4. In view of the provisions of the act of June 22, 1910, lands classified as coal subsequent to the date of that act, are not subject to indemnity selection by the Northern Pacific Railroad Company.

By the decision of the Commissioner of the General Land Office it was held that inasmuch as these tracts were classified as coal lands before the date of filing the selection, the selection was allowed erroneously and was thereupon rejected.

The railroad appealed to the secretary from this decision. It contended in the support of this appeal that under grant to the railroad company that the act of July 2, 1864, the company is entitled to select land although coal in character. This is based on the statement in the act of 1864 where the word "mineral" in the act "shall not be held to include iron, or coal." This contention is in direct contravention with the language used in the withdrawal under date of October 13, 1906, and upon careful consideration the department is convinced that the railroad company obtained no right to mineral lands by the statute cited.

FOUR PROBLEMS ARE INVOLVED IN APPLYING FLOTATION TO JOPLIN ORES

Quantity of Material Treatable without Further Crushing—Possibility of Regrinding Material—Oils Best Suited for Work and Effect of Acid Waters Must be Considered by Missouri Operators

During the past year the Bureau of Mines has been carrying on mill tests in the Joplin District, Mo., to determine the losses at the lead and zinc mills in the district and the possibility of lessening them. The average recovery of zinc at mills is between 60 and 70 per cent, although recoveries are somewhat higher at some of the better equipped mills.

Clarence A. Wright, of the Bureau of Mines points out the possibilities of treating the ores by flotation, the conditions that must be met, and the problems that must be worked out to insure success on a commercial scale. By flotation is meant all processes in which minerals are separated by being made to float on the surface of a liquid or on a mass of bubbles.

JOPLIN MILLS

In the Joplin District the mills are small, their capacity being 100 to 500 tons of ore in 10 hours. They are equipped with crusher, rolls, jigs and tables. At most of them the material that reaches the jigs is half-inch size. The middlings, locally called "chats," from the jigs are recrushed for further treatment by sand jigs or tables, or, in some mills, returned to the rougher-jigs. Middlings from the tables are seldom recrushed. The first point to be considered, Mr. Wright concludes, is how much material now being produced is fine enough to be amenable to flotation, or, in other words, what percentage of the total tonnage treated is crushed to a suitable size, and what proportion of this size can be saved.

Screen analysis of the total tailings from several mills showed that the percentage of material passing a 65-mesh screen (Tyler standard screen with openings 0.208 mm., or 0.0082 inch in diameter), was 3 to 16.4 per cent, according to the character of the ore and the fineness of crushing, the 16.4 per cent being for a mill treating "soft-ground" ore.

Zinc ores containing a comparatively large proportion of lead and iron sulphides would require preferential flotation (which would have to be worked out) or retreatment of the concentrates on tables. A preliminary treatment of the flotable material on tables to eliminate the lead and iron has been suggested, but would require extra tables, and its efficacy is doubtful.

RETREATMENT

Retreatment of the concentrates on tables seems to be the most feasible method of separating the lead and iron sulphides from the zinc blende, and could be accomplished at small cost by using a small diaphragm pump to return the tailings from the tables to the flotation system, making a closed circuit. This method of retreatment gives satisfactory results in some Western mills. The froth from the concentrates is largely "killed" by spraying it with water, or by some other effective means, before it comes to the table. The ease with which the froth is killed will depend, also, on the oil or oil mixture added to the pulp.

The composition of the gangue in the Joplin district ores differs somewhat and the mineral content varies. Consequently, though many available oils give acceptable results, no one oil or quantity of oil will give the best possible results for all ores, and the best oils or mixture of oils must be determined by experiment.

The Bureau of Mines, in cooperation with the Missouri State Geological Survey, started flotation experiments in the Joplin District in the latter part of the year 1914 and continued them until the spring of 1915.

In the first experiments different oils were tried in varying quantities to determine which oil was best suited to the material treated. When the number of oils had been cut down to three or four, the same tests were repeated with the addition of sulphuric acid in varying quantities. The effect of temperature was then determined.

WOOD OILS BEST

It was found from the preliminary results that the sulphides of this district are apparently not difficult to separate from the gangue by flotation, and that a fairly good grade of concentrate could be obtained by the use of "rougher" and "cleaner" cells. Oils with a tar base gave a high recovery, but a low-grade concentrate carrying a considerable amount of gangue. Other oils gave higher-grade concentrate, but not as good an extraction under the same conditions. The best results were obtained from wood creosote and pine oils.

To verify the data obtained from this preliminary work, slimes produced from one of the sheet-ground mines near Webb City, Mo., were shipped to Salt Lake City, Utah, where the Bureau of Mines in cooperation with the University of Utah is conducting flotation experiments. The results of the experiments, which were performed by O. C. Ralston and G. L. Allen, of the Bureau of Mines, showed that it is fairly easy to float the sphalerite from the gangue by using warm solutions and about one pound per ton of any suitable oil, either from wood or coal distillation, and that acidity, although it does seem to be necessary, allows the froth and tailings to separate more quickly. Cold solutions gave as high extractions as warm solutions, but the grade of the concentrates was not as high.

A scheme making use of rougher and cleaner units of flotation cells seems essential in order to get a high extraction and concentrates of acceptable grade.

In the experiments made in Joplin, the thickness (ratio of solids to water) of the pulp treated ranged from 1.3 to 1.7. In practice the most favorable ratios for different ores would, of course, have to be determined by experiment.

In general, a mixture of sand and slime requires a denser pulp, whereas for a mixture consisting wholly of slimes (finer than 200-mesh) a thinner pulp is desirable. Thickening of the slimes from the Joplin District mills would be necessary, and could be accomplished by the use of Dorr thickeners or some other device that would give the flotation machines a uniform feed of constant thickness.

The addition of acid may not be absolutely essential for all the ores of the Joplin District, although the local tests showed that a small quantity of acid was of great help, especially in cleaning the concentrates.

CONCLUSIONS

In conclusion, the problems to be solved in applying flotation to the ores in the Joplin District may be summarized as follows: (1) the quantity of material treatable by flotation without further crushing; (2) the possibility of regrinding a part or all of the material; (3) the oils or oil mixtures best suited to the material to be treated; and (4) the effect of the acid waters present in some of the mines of the district. The last two problems can be best solved by setting up a small test machine in each mill.

A flotation process, when worked out, will be of great help in raising the percentage of extraction, but operators should note that a saving is possible at other stages in the concentration of the ores and should investigate these more thoroughly.

To Send Exhibit

The Bureau of Mines will have an exhibition at the Centennial of the State of Mississippi, which will be held at Gulfport early next year.

UTAH COPPER COMPANY LOADS 586 CARS IN A DAY

Perhaps the most noteworthy accomplishment of this era of rapid advance in mining processes and science is the great excavating efficiency that has been achieved by the Utah Copper Company. The biggest month ever had at the mines of the Utah Copper Company was August, 1915, when a total of 1,979,502 tons of waste and ore was mined. "Our steam shovels worked a total of 775 ten-hour shifts during that month, corresponding to an average of 2,554 tons per shovel shift and an average of 63,855 tons of rock per day," says R. C. Gemmell, the general manager of the company.

"The greatest amount of ore that we have even loaded was on July 8, 1915, when a total of 37,724 tons was loaded into 586 railroad cars. The total quantity of capping handled during the month was 1,036,991 tons, corresponding to an average of 33,451 tons daily. Therefore, it may be assumed that on July 8, the total tonnage of ore and waste mined was 71,175.

"All of the material handled at our mines is hard, solid rock, and it has to be blasted. The loading is done by twenty steam shovels, working on as many benches, with the top bench having a vertical elevation of about one-quarter of a mile above the lowest bench. This is an entirely different proposition from that where dredges on the Panama Canal are working on soft, sliding material. Moreover, the capacity of dredges is much greater than of steam shovels."

Faithful Negro Dies

In the passing of Anthony Mason, a negro messenger at the Geological Survey, George Otis Smith, the director, pays him the following tribute:

Born in slavery and remaining a slave until he reached man's estate, he started in life with the disadvantages imposed by such conditions. Clarence King lived at a hotel in New York where Mason was a dining room waiter and thus came to know him. When Mr. King came to Washington as the first director of the newly created Geological Survey he brought Mason with him to act as messenger at the director's door. It thus came about that Mason was one of the first appointees, the date of his appointment being July 8, 1879. From that date until the day of his death, a period of nearly thirty-seven years, with unvarying loyalty and punctuality he served as messenger at the director's door.

By his uniform courtesy, his fidelity and his absolute honesty he won the respect, esteem and warm personal regard of all with whom he came in contact—in an organization numbering nearly 900 persons. Measured by the highest standard this man was a success in life of which he might be justly proud. He leaves behind only kindly memories among troops of friends.

GEMMELL HEADS UTAH COMMISSION TO STUDY WORKMEN'S COMPENSATION

Will Submit Report to Next Session of Legislature—Hartley Gives out Statement in Salt Lake City—Exhibits from San Francisco Exposition Are Being Set up in Mining and Metallurgical Building of University of Utah

By A. G. Mackenzie

Salt Lake City, March 25.—Gov. William Spry, of Utah, has appointed the following as Commissioners to investigate workman's compensation and employers' liabilty and to recommend legislation to the next Utah legislature which meets in January. R. C. Gemmell, general manager of the Utah Copper Company; Don B. Colton, State Senator from Uinta County; Ira R. Browning, State representative from Emery County; H. B. Windsor, President of Windsor & Co., Insurance; LeGrand Young, attorney of Salt Lake; Henry K. Russell, of Salt Lake, and Charles H. Pearson, of Ogden. Messrs. Gemmell and Windsor are named as employers of labor, and Messrs. Russell and Pearson as representatives of labor. The commission which was created by the legislature of 1915 is to submit its report and recommendations sixty days before the next session of the legislature.

Mr. Gemmell is Governor of the Utah Chapter, American Mining Congress.

Carney Hartley, of Denver, chairman of the Committee on Forest Relations of the American Mining Congress, was interviewed at Salt Lake recently, and announced that his committee was doing all it could to encourage the prospector to become familiar with the regulations of the forest reserves in so far as they relate to prospecting. He said a belief was more or less prevalent that prospecting is not permitted on forest reserves, whereas in fact it is not only permitted but prospectors are subjected to only the usual regulations imposed on persons who enter forest reserves.

Mr. Carney said the outlook was for one of the liveliest years in prospecting for a long time past, with a renewed and intelligent interest in metal mining among eastern investors, due to the increased prices of metals. He said it is harder to find a mine in marketable shape in Colorado than it is to find a man to buy it.

The Daly-Judge Mining Company, of Park City, has announced that it will build an electric smelting plant at a cost of $100,000 to handle the zinc product of the company's properties. Two sites for the plant are in consideration, one in Deer Valley and another on the flat below the town of Park City. The project contemplates obtaining power and increased territory through acquisition of the Snake Creek Mining & Tunnel Company, which will give the Daly-Judge more than 2,000 acres of patented ground, extending three miles on the strike of veins, an adequate water supply for power, complete drainage and most advantageous working conditions.

The financing of the new plant will be through an increase of stock of the Daly-Judge which will be offered to present stockholders of the company.

General Manager George W. Lambourne says in connection with the plans that a study of 1915 operations shows that had such a smelter plant been in operation last year and treated the mines' output, earnings would have been more than double.

The Daly-Judge has produced almost 87,000,000 pounds of zinc.

The new plant will be similar to those at the Bully Hill properties in California, at Trail, B. C., and at Anaconda.

UTAH EXHIBIT

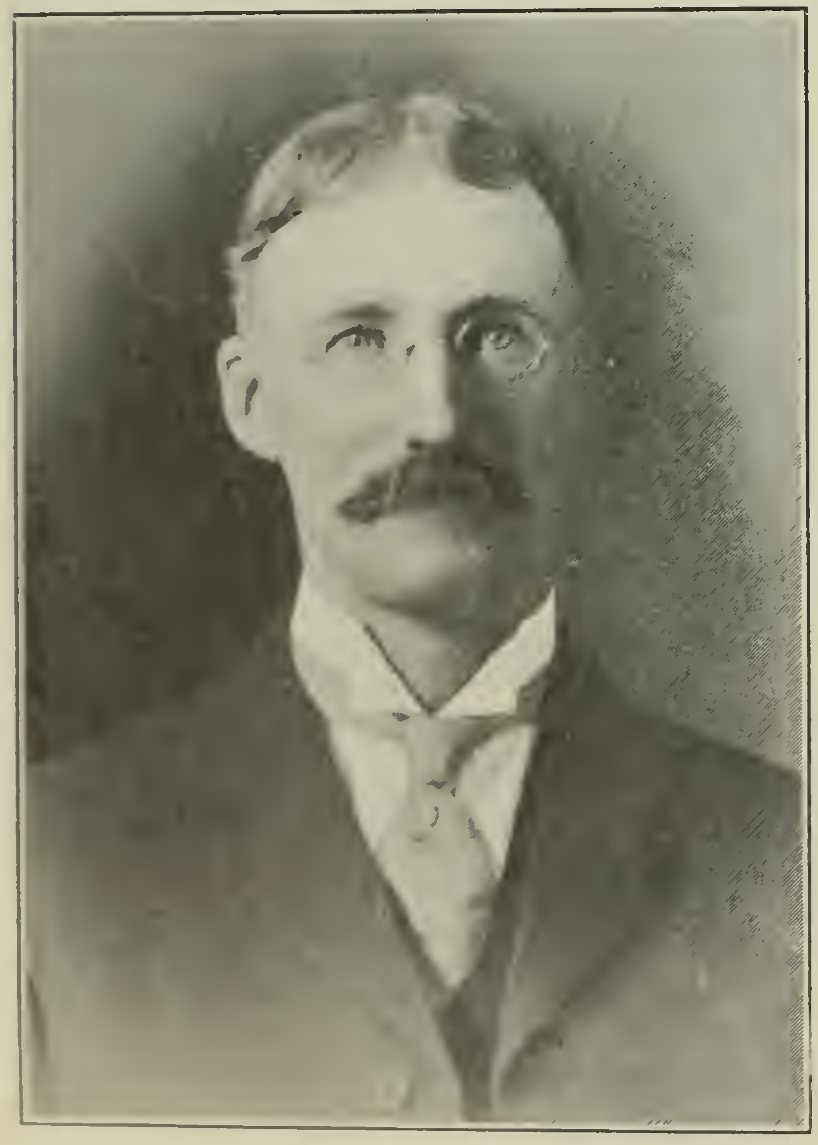
The University of Utah has issued the following statement:

The exhibit of charts and cases of minerals displayed by the Metallurgical Research Department of the University of Utah at the Panama-Pacific International Exposition has arrived at the University and is being set up in the mining and metallurgy building. The exhibit consists of two large plate glass cases containing an educational series of Utah mineral and metallurgical specimens representing the consecutive steps in typical ore dressing and metallurgical processes, along with fifteen charts descriptive of the mining and metallurgical resources of the State of Utah.

Although available space is difficult to find in the crowded building, portions of the exhibit are being set up wherever any suitable space can be spared. This display material is directly in line with the work of the mining, metallurgy and metallurgical research departments and will serve as a nucleus for a more comprehensive series of specimens and charts to illustrate the types of minerals and ores and the commercial products possible to obtain from the same, that make up the very extensive mineral resources of the state.

It is the desire of those in charge of the departments to build up a mining and metallurgical museum somewhat after the nature of the exhibit by the U. S. Geological Survey that was on display in the Palace of Mines and Metallurgy at the San Francisco Exposition; entitled "Minerals and Their Uses." In the proposed collection will be shown the principal minerals and ores of Utah along with the product resulting from the commercial treatment of the same, together with the uses to which these minerals and products are applied. The series will make an attractive and highly educational display and will serve to stimulate the ambitious student and interested visitor to lend his efforts toward developing the mineral resources of the State of Utah.

GOVERNMENT EXPERTS WELL KNOWN TO MINING MEN



F. L. RANSOME, GEOLOGIST

Dr. F. L. Ransome was born in Greenwich, England, in 1868. His grandfather was the inventor of an artificial stone which was used extensively in construction at that time. The company, exploiting the patents in the United States, established a factory at San Francisco. Some difficulty was experienced in the manufacturing process and Dr. Ransome's father was sent out from England to straighten the trouble out. The elder Ransome made San Francisco his home thereafter. At the time his parents came to the United States Dr. Ransome was three years of age. He was educated in the public schools of San Francisco and secured his higher education at the University of California. In addition to the regular university course he took three years of post-graduate work and won the degree of Ph.D.

Dr. Ransome took the first set of civil service examinations given by the Geological Survey. George Otis Smith, the present director of the Geological Survey, and Arthur C. Spencer, a geologist still in the Survey service, took this same examination for geologist.

As there was no vacancy in the Survey at that time, young Ransome went to Harvard, where for a year he taught mineralogy and petrology. A vacancy then opened on the Survey, and he began his work as assistant geologist under Dr. G. F. Becker. During the summer vacation, for a number of previous years, he had done some work for the survey and owing to the experience thus gained, he was assigned to work on the mother-lode district of California. In 1900 he was promoted to the rank of geologist and in 1912 was placed in charge of the section of western areal geology. The succeeding year he was given charge of the section of metalliferous deposits, succeeding Waldemar Luidgren.

Principal among the publications of which Dr. Ransome is the author are: Reports on the Globe and Bisbee Districts of Arizona; Silverton, Cripple Creek and Breckenridge Districts of Colorado; Couer d'Alene District of Idaho and Goldfield of Nevada.

Dr. Ransome is a member of the National Academy of Sciences.

Frederick C. Ohm Dies

Frederick C. Ohm, of the United States Geological Survey died in Washington March 14. Mr. Ohm was an expert section maker in the petrographic division of the Survey. He was considered the most able man engaged in this work in the United States. He had been with the Geological Survey since August 14, 1886.

Mr. Ohm was born in Denmark fifty-eight years ago. His father was court photographer to the King of Denmark. He belonged to the Federal Lodge of Masons, and also was a member of the Trowel Club of the Interior Department. He was a leading member of the Bethlehem Chapter of the Order of the Eastern Star.

Water-Supply Paper Issued

Water-Supply Paper 332 has been issued by the U. S. Geological Survey. It deals with the surface water supply of the North Pacific Drainage Basins. It was prepared by Nathan C. Grover, chief hydraulic engineer, F. F. Henshaw, G. C. Baldwin, and W. A. Lamb, district engineers. It was prepared in cooperation with the States of Montana, Idaho, Washington, and Oregon.

THOUGHTS ON MINE LEGISLATION

S. A. Driver, Kitts, Ky.

Someone has said that the future historian will class the present age as distinctly a new age as was the Renaissance. Time alone can prove the truth of this assertion, but it is certainly clear that the duties and responsibilities of the individual are today being greatly lessened, and the functions of the State correspondingly increased. The sturdy self-reliance and rugged independence of the pioneer are passing away, and the present generation is being taught by politicians, press and pulpit to rely upon the community or the State to supply the deficiencies which are due to a lack of individual effort.

The enlargement of the duties and powers of the State is a natural evolution, an evolution so rapid that it is almost revolution, due to the sudden and complex changes in the environment of the life of the present day, and any effort to impair the just powers of the State would be an attempt to turn the hands of the clock backwards. But if the individual fails to discharge his full duty to society the State will in the end become powerless to meet its obligations to the units which compose it.

Man alone, of all organisms, can regulate his environment, and control his evolution, and if society fails to impress upon the individual the value of effort on his part, and the duty of every member, be his station high or low, to bear his part of the general burden, the progress of the race will be arrested, and a period of retrogressive evolution will follow.

Careful study of the laws which regulate coal mining in the different States will show that nearly all sections of the law which apply to the safety of the miner are aimed at the operator; the liability and duty of the miner to himself and his fellow workmen is overlooked. This condition is in entire harmony with the tendency to teach the one that the many must care for him. Hundreds of articles addressed to the operator, superintendent and foreman are every year delivered from the rostrum and appear in the press, all directing them to do more and more for the safety of the employe. Not for an instant should this effort be abated, but how many are directed to the man directly responsible for accidents, and most vitally concerned in their prevention, "the man at the face?"

All men who are sincerely interested in the safety of the miner will fail to discharge their duty to him unless they devote the same time, energy and intelligence to making him fully realize that the burden of his safety is as much his own individual burden as it is that of the operator. The unusual, the abnormal easily attract attention. Great catastrophies instantly arrest our thought, and set on foot profound researches, but the little things of everyday life, which in the limit are of greater and more vital importance, must be touched by the hand of genius to be seen in their true light, and given their real value, and this truth suggests another thought in connection with mine legislation as applied to accident prevention, which is that it had its inception in the great disasters of the industry; an explosion or fire in a mine flicks out hundreds of lives in an instant, millions of people read the account in the morning papers and a general demand for more stringent mine laws assails the lawmakers. Here it should be said that most operators today cheerfully comply with all laws enacted with fairness and intelligence for the purpose of preventing not only great disasters, but the everyday accident as well, and the few who do not comply should be made to suffer the full penalty.

Of every one hundred men killed underground, a little more than fifty two are killed by falls of roof and coal. Only a small number of these accidents were unavoidable; nearly all could have been prevented by the exercise of ordinary skill and care and a few moments' labor by the miner—by the setting of one prop. The failure of the miner to set this prop is very seldom due to lack of knowledge that the prop was needed at that particular spot. It is generally due to carelessness, laziness or greed, greed being defined as unwillingness to take the time from loading when cars are being received in quick succession, or, as the miner expresses it, when the turn is extra good.

When the operator has given the miner a safe way of reaching a working place in an entry, room or pillar, which at the time the miner accepts it, is safe and roof conditions are normal for the mine or district, and sees that the miner's orders for suitable timber are promptly complied with, it would seem that the operator had discharged his duty in protecting the miner from falls of roof and coal, and that by education or legislation the miner should be made to realize that he must do his part like a man and take care of himself.

The policy of multiplying company inspectors and safety bosses is not only becoming a serious financial burden on the operator, but is impairing the efficiency of the miner by making him depend upon another for the protection which he should give himself. Furthermore, the miner, in his work of extracting coal, is constantly changing conditions and creating new dangers and to protect against these would require a safety boss for each working place. Under certain exceptional competitive conditions corporations of great capital can have a staff of inspectors so large that each place which is being worked will be visited by the district inspector at intervals not exceeding three hours, but there are many small operators, conscientious and humane, who give the public some of its best and cheapest coal, hustling day and night to meet pay rolls with coal sold in keenest competition, who would be forced to close their mines if compelled to follow this policy. If the little fellows are put out of business, the great industrial corporations who now run their mines not for direct profit from the coal, being satisfied with a production cost, which does not exceed the price at which the coal can be bought in the open market, would have to supply the public with coal, they would then no doubt want a profit from the operation of the mine.

When the small operator is put out of business, the big fellow can have a safety boss for every ten men, should the law so require, and let the public foot the bill.

It is now required in some States that the company inspector must not only direct the miner whose sight is as acute, whose ear is as sensitive as his and who knows as well as he that this particular post is needed, to set a post, but must wait and see that the post is set. There is neither justice to the operator nor mercy to the miner in this policy, for it imposes an unnecessary burden on the one and makes the other a careless workman.

When negroes from the cotton fields of Mississippi or Hunkies from the wheatfields of Hungary are first placed in the mine, we even fill and trim their lamps, and they should be given conscientious care, but from the start let him know that you expect him to learn to walk alone, to get out of the kindergarten and take care of himself. We have had the great catastrophy to arouse the mining profession and the public to the necessity of making the employer do his part toward accident prevention, but where is the genius who will awaken them to the even greater necessity of making the miner protect himself? He will not come from the ranks of the union miner, because the U. M. W. of A. is opposed to any increase of individual responsibility or efficiency. Its catechism has no place for the one, and the other is not found in its lexicon. This union has in this country and in England opposed every suggestion for the safety of the miner which involved any extra labor or time on his part. It has resisted the operation of every safety practice the burden and expense of which did not rest on the operator. The cardinal tenet of this union is: "Do less work and get more pay." It constantly demands shorter hours of labor and increase of the daily wage It does not aim to improve the poor workman—the demand for payment on a mine-run basis is one striking evidence of this—it drags the skilled workman down, and reduces its members to one monotonous level of mediocrity while the consumer foots the bill, or corporations go into bankruptcy. When will the public sit up and take notice?

We need not, therefore, look for this genius in its ranks and we fail at the present to see any signs of him in the ranks of the operators or legislators. We must, therefore, try staff-planning, which may even discount genius. Surely, among the ranks of the various operators' associations, mining congresses, and safety societies are talents, which, combined, can plan a campaign for safety miners, as well as safer mines. The Bureau of Mines was created to investigate and set in operation methods and practices in mining which would protect the life and limb of the miner. The first problem which appealed to it was the prevention of explosions and accident from explosives. The results achieved in this line have more than justified its creation and continuation. The members of this bureau are men of high technical ability, well tried physical courage, and conscientious devotion to duty, men who command confidence and respect. They have made many excellent suggestions to operators, and are constantly setting on foot investigations designed to reduce the death and accident rate. These have, however, usually dealt with accidents due to explosions and the use, or misuse, of explosives. They have given the operator excellent advice on making the mine safer. They might give a little to the miner on making himself safer and induce him to adopt this advice, as have the companies.

During the three years 1910, 1911, 1912, 7,146 men were killed under ground; of this number 3,782 were killed by falls of roof and coal, 1,198 by explosions, 443 by explosives. It is thus shown that of every 100 men killed under ground, fifty-two were killed by falls of roof and coal. To attain a reduction of this high death rate, so earnestly desired by operators and mining engineers, we must reach the man at the face; if this cannot be done by education, then by legislation. The writer freely admits that the solution of this problem of safer miners is beyond his powers, but when we think of the wonderful accomplishments of staff-planning and team work in other fields of human endeavor, we are constrained to believe that a campaign of education and legislation can be planned and executed which will result in safer miners.

Workmens' Compensation Laws furnish another example of the same tendency by placing the entire cost of insurance on the operator. Any law which fails to place upon the miner his fair share of the cost of insurance, is not only an injustice to the employer, but an injury to the miner, for, when he is given insurance without cost to himself, and compensated for accidents which are the direct result of his own carelessness, he most certainly will not become a more careful workmen, and the result of the carelessness too often only begins with himself. A brattice man working for the writer in a state which has no compensation law, observed a man working under a rock which needed a post, and remarked: "Bill, you ought to put a prop under that rock." To this Bill replied: "Well, if it falls the Company will have to pay the damages anyway."

What will be the effect of free insurance on such men? We know, too, that their name is Legion. The majority of mine operators would welcome any compensation law based on justice, enacted with wisdom, and enforced in accordance with the rule of reason, and any law which does not meet these requirements, will fail to conserve the best interests not only of the mine owner and miner, but of society. Justice to the miner, as the writer knows him, requires it to be said that the miner would not only willingly but gladly bear a part of the cost of insurance, if the ambulance chaser, the walking delegate, and the demagogue had not advised him to the contrary.

It is the belief of the writer that the miner is paid for the extra risk he assumes, or the hazard of his calling, in the higher wages which he receives, as compared with the workman who expends the same daily energy in callings which require as great a degree of skill as mining, and that society is under no greater obligation to insure the miner than other tradesmen or even farmers. Daily we are becoming more and more members of one body, but why is the body under greater obligation to the member which warms it than to the members which feed and clothe it? Granting, however, that civilization has reached a point in its evolution where State insurance of many kinds has become necessary, but we must remember that by divine sanction the treasury of the Temple required the widow's mite. This was for two reasons: First, giving it made her feel a direct interest in the administration of the Temple's finances, and she experienced the satisfaction which comes to all who do their part. The other is—many mites make a talent. This even love unites with reason and justice in requiring the State to make every member, no matter how insignificant or small, to contribute directly to the general fund, and in no branch of the state's activities is this demand stronger than in workman's compensation.

HAS TAKEN INTERESTING PART IN WEST'S DEVELOPMENT

D. M. Riordan, a mining engineer, of San Francisco, was in Washington March 10 and 11.

Mr. Riordan is one of the most interesting characters in mining engineerng work. As a boy he walked across the plains to hunt gold in Nevada and at nineteen years of age was telegraph operator on the railroad running south from Reno, and was in charge of several hundred men cutting wood for the mines.

He is a veteran of the Civil War and is a remarkably well preserved man. After the war he was in charge of the forts in the Southwest during the time of the Indian disturbances and was engaged in the pursuit of Geronimo.

For a considerable time he sawed lumber in the neighborhood of Flagstaff and after two disastrous fires cleared a large sum from his operations. He was in charge of the Standard Mine at Bowdie, California, during its hey-day.

His house was near the mine and he tells that waking up one night and hearing strange sounds coming from the stamping mill he knew something was wrong and that the stamps were not crushing quartz, nor were they striking the mortars. He dressed and went down to the mill and found, he says, that so much gold had been crushed from the rock that the stamps were pounding on it and doing no further crushing.

Mr. Riordan generally carried the bullion from the mines to the express office himself but for some reason one day he could not go, and delegated another man to carry the treasure. The messenger started with a four-mule team and a short distance from the assay office was held up by highwaymen. Instead of shooting one of the lead mules when the messenger did not stop at his command, they fired at the messenger and killed him. The mules ran away and carried the body of the dead man and the treasure back to the office.

For a time Mr. Riordan acted as Indian Agent for the Navajos in Northern Arizona and gained their confidence to such an extent that whenever they were in trouble they made immediately for his house at Flagstaff. There seems to have been a habit among certain interested parties to get up Indian scares periodically, and at such a time the contractors would make considerable sums selling supplies to the soldiers. On one of these occasions a white man created trouble with an Indian and immediately called for the soldiers, stating that the Navajos were again on a rampage and the settlers were badly in need of help. The Indian in the case immediately made for Mr. Riordan's house at Flagstaff and told him his story. Mr. Riordan wired in his characteristic way to the commissioner of the soldiers about as follows: "The Indian insurrection is in my kitchen eating supper. Do you want him?" The soldiers were not sent.

At the time of the European war, when Americans were stranded in Europe, Mr. Riordan was appointed a special agent of the Treasury to carry funds and see to their distribution among stranded Americans, and to make arrangements for their return.

Mr. Riordan was for years interested in the La Grange mine near Weaverville, Trinity County, Cal. This is one of the largest hydraulic mines in the United States. It has recently changed hands.

FINENESS OF COAL DUST HAS RELATION TO ITS EXPLOSIBILITY

Important Results Being Attained from Experiments by Bureau of Mines at it Pittsburgh Station—Only Small Amount of Very Fine Coal Dust Is Necessary to Propagate an Explosion, Tests Show

A series of tests are being made at the Pittsburgh station of the Bureau of Mines to determine the relation between the fineness of coal dust and the proportion of the different sizes and its explosibility, alone or in mixture with other dusts. Although the series is not yet completed, enough tests have been made to show roughly there is such a relation. The tests seem to indicate that dust larger than 20-mush has little effect in propagating an explosion. Tests have been made on three mixtures of sizes finer than 20-mesh, the mixtures containing 20 per cent, 40 per cent, and about 75 to 85 per cent finer than 200-mesh. Reducing from 85 to 20 per cent the proportion of 200-mesh dust in such mixtures lessen explosibility so much that the percentage of shale required to prevent propagation is reduced from 80 per cent to about 65 per cent for Pittsburgh dust. This reduction in the proportion of shale necessarily seems small when stated as a percentage, but is shown to be considerable when stated in relative quantities; for instance, the amount of shale required with pulverized Pittsburgh coal dust is four times that of the Pittsburgh dust present, whereas, with coal dust having only 20 per cent finer than 200-mesh, twice as much shale as coal dust will prevent propagation. In other words, the ratio of shale to coal dust is reduced from 4:1 to 2:1 when the percentage of 200-mesh coal dust is reduced from 85 to 20.

20-MESH AND FINER

Tests have again shown the surprisingly small amount of coal dust necessary to propagate an explosion. One violent explosion was obtained when there was only 0.3 of a pound of pulverized coal dust per foot of entry. The maximum effect for the experimental mine conditions is reached when the amount of coal dust, mixed sizes finer than 20-mesh, is about four pounds per foot. With more dust explosibility seems lessened, but further tests are needed to determine this point.

COARSE SHALE DUST

A series of tests was made to determine whether shale dust coarser than that previously used (about 95 per cent through a 200-mesh screen) would be satisfactory. Practically all of the coarser shale would pass through a 20-mesh screen, but only about 27 to 30 per cent through a 200-mesh screen. This coarseness had little effect on the quantity necessary to prevent propagation; only about five per cent more shale being needed than when the pulverized shale was used. Curves showing the relations have been prepared and will be submitted to the field men for their information.

BERNICE ANTHRACITE

A series of tests with Bernice, Pa., anthracite showed no propagation until there was more than 2 per cent of gas in the air current.

SHORT-ZONE GALLERY TESTS

Explosibility tests with coarse coal dust and coarse shale dust are being made in the steel gallery at Pittsburgh to determine how such short-zone tests compare with the longer zone tests in the experimental mine. It is thought possible that the explosibility of different coal dusts, as estimated from the analysis can be checked in the steel gallery, so that much smaller shipments of dust will be needed for the mine tests. So far, the results have not been altogether successful, but it is hoped that a satisfactory method can be developed.

SAFETY-FIRST EXHIBITS TO BE DISPLAYED ON TRAIN

It has been decided definitely to send out a train containing the principal exhibits which made up the Safety-First Exposition held recently in Washington. This will give an opportunity to a large number of persons to see this very instructive group of exhibits and will bring home to the public in general the importance attached to the safeguarding of human life by the Federal government.

While the limited space in railway cars is such as to render impossible as complete an exhibit as was shown in Washington, by the twenty-five government bureaus which participated, it will give a very good idea of the exposition which attracted so much attention here.

It is hoped that the cars may be fitted up and ready to start by May 1. It is probable, however, owing to the large amount of work necessary, that it will be June 1 before preparations can be completed.

Latest Mining Patents

Mine Breathing Apparatus. No. 1,176,711. This invention is by William E. Gibbs, of New York, N. Y.

The invention relates to that class of mine-breathing apparatus which supplies an artificial atmosphere to a worker in a poisonous gas and permits the wearer to enter with safety an exploded or burning mine or other inclosure whose the contents are irrespirable.

The object of this invention is to overcome the objectionable features in such apparatus and to produce a breathing apparatus having a maximum degree of safety with a minimum amount of discomfort to the wearer.

Mr. Gibbs considers the following elements of the apparatus to have special advantage over the forms of appartus now in use: The breathing chamber, the purifying or regenerating can or receptacle, the reducing valve and the pressure gauge and in addition, the fact that all of these parts are carried upon the back of the wearer, thus placing the apparatus in a position least inconvenient to the wearer. The breathing chamber is provided with metallic walls which furnish a large radiating surface, thus obviating the need of a special cooling chamber.

One of the objects of the invention is to dispose the absorbing material so that its surface will remain practically constant as it is consumed, to provide free passage for the carbon dioxide past the absorbing material in such maner that the used part will remain securely in place until the whole is consumed.

The invention provides for coating thin wire guaze sheets with fused euastic soda or other suitable carbon dioxid absorbing material so that the sheets support and strengthen the plates while in use. Several such plates are placed vertically and parallel to each other in the path of the carbon dioxide which is to be absorbed, the plates being spaced a sufficient distance apart to permit the free flow of the expired air there-between.

REFINING OF PEAT

Apparatus for obtaining the products of Peat. No. 1,175,919. This invention is by Ellis Bartholomew, of Toledo, Ohio, and is assigned to the National Peat Refining Company, of Cleveland, Ohio.

This invention relates to apparatus for extracting the commercial by-products contained in peat, and in providing a means for evaporating and purifying certain hydrocarbons such as are derived from peat.

The invention has lobe-shaped portions located one above the other and communicating with each other. Electrically heated rods are located above and at the lower end of each of the portions.

CONTROLS FEEDING

Mining Machine. No. 1,175,179. This invention is by Frank Carthdge, of Terre Haute, Ind.

The invention relates particularly to that class of mining machinery wherein cutter blades are carried by a power-driven endless chain, the chain referred to is movable transversely to feed the cutter blades into the material being mined.

The objects of the invention are to provide an effective means for controlling the feeding of a mining machine. It also provides means for varying the angle between the cutter chain and the body of the machine to suit varying conditions. Provision is made for disconnecting the cutter chain from its operating mechanism.

LUBRICATION IMPROVEMENT

Mine Car Wheel and Bearing.. No. 1,175,218. This invention is by James J. Roby, of Cleveland, Ohio.

The invention relates to a mine car wheel and bearing of improved construction. The primary object is to provide a wheel and bearing which will permit of lubrication from a distant source of supply of the lubricant. It also provides wearing parts which are capable of being removed and in which repairs can be made easily.

COOLS QUICKLY

Cooling Ores. No. 1,175,273. This invention is by William H. Hubbard, Jr., of Newark, New Jersey. It is assigned to The Ohio and Colorado Smelting and Refining Co., of Denver, Colo.

The invention relates to the cooling of ores from metallurgical or other furnaces. For instance, it may be applied to the pre-roasting furnace of the Godfrey type, when the product is to be treated further on Dwight & Lloyd machines or the like. The idea is to effect the cooling quickly and cheaply, and at the same time avoid dust and smoke and bring the ore into good physical condition for easy handling and further roasting.

IMPROVES LAMP

Miners' Safety Lamp. No. 1,176,420. This invention is by William Best, of Morley, England.

The invention relates to oil-illuminated miners' safety lamps of the shielded type, wherein the upper part of the lamp frame is fitted with a cylindrical metallic shield or bonnet inclosing the lamp gauze.

The object of the invention is to provide means whereby the upper body portion of the lamp and also its carrying hook shall be rendered capable of being taken hold of by the hand without discomfort to the user.

SEPARATION OF SKIMMINGS

Process of Treating Aluminum Skimmings, Screenings, Slags or other Materials. No. 1,176,272. This invention is by Paul R. Hersman, of Milwaukee, Wis. It is assigned to William Jobbins, of Aurora, Ill.

This process provides for separating the skimmings from the larger pieces of metal occurring with them. The residue is washed with water and the water separated from the undissolved portions of the skimmings. The solid portion is treated with hot sulphuric acid. The dissolved copper is separated by precipitation methods. The purified sulphate of aluminum liquor is evaporated to such density that upon cooling it crystallizes to form aluminum sulphate.

SEPARATES ORES

Ore-Separating Apparatus. No. 1,173,498. This invention is by Riley D. Fassett, of Denver. It is assigned to the Gold Dust Concentration Co., of Denver.

The apparatus comprises a washing or vibrating table. The vibrations are lateral and the table may be inclined both transversely and longitudinally.

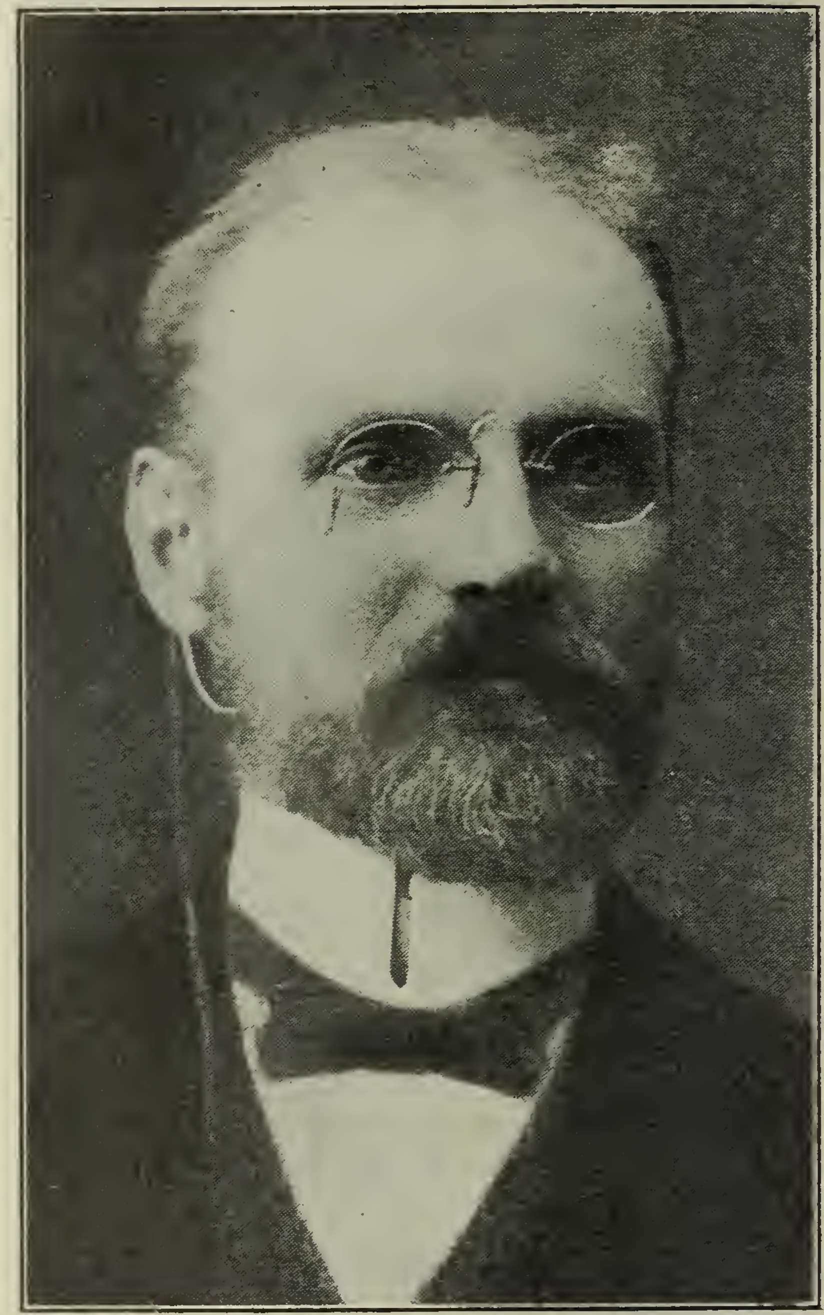
Methods for the manufacture of Chlorates and Perchlorates of Alkali Metals. No. 1,173,346. This invention is by Arthur E. Gibbs, of Wayne, Pa.

The electrolytic part of the method takes place in a cell such as is used for the production of alkali and chlorin. The chlorin produced is removed from the anode compartment before combination with alkali takes place. Some or all of the chlorate and chloride formed from this combination is returned to the anode compartment of the cell and is allowed to pass through to the cathode compartment when it again becomes strongly alkalin and is ready to absorb more chlorin thereby increasing its chlorate content. The chlorate is separated afterward.

WILL WORK UP LOT OF COLORADO PITCHBLENDE ORE

The National Radium Institute has entered into a cooperative agreement with the Colorado & Gilpin County Gold & Radium Mining Company to work up, on an experimental basis, the pitchblende ore mined some two years ago from the German, Belcher & Wood mines, located on Quartz Hill, Gilpin County, Colorado.

The pitchblende ore, consisting chiefly of low grade material, has been shipped to the concentrating mill at the Colorado School of Mines at Golden, where it will be concentrated. The ore consists of four carloads of low-grade ore, some 920 pounds of high-grade concentrates and 11,906 pounds of pitchblende, supposed to run somewhere around 20 per cent uranium oxide. On concentration of the low-grade ore, the concentrates will be worked up in the plant of the National Radium Institute at Denver.



PROF. J. M. ROBERTS
Who occupies the chair of safety engineering at the Colorado School of Mines.

No definite estimates can be made at this time of the output of radium for the ore has not yet been accurately sampled and analyzed. According to preliminary estimates made by the owners of the ore, the whole contains something less than 6,000 pounds of uranium oxide. The extraction of the radium and the development of methods for treating pitchblende will be under the direction of the experts of the Bureau of Mines, and it is hoped to develop methods which can be used for the extraction of radium from pitchblende which are equal to those used in the extraction of this same element from carnotite.

By the agreement with the National Radium Institute the radium extracted is to be used entirely for philanthropic or scientific purposes and is not for sale. The uranium oxide extracted will become the property of the Bureau of Mines to be used in experimental work.

TO ACQUAINT PROSPECTORS WITH REGULATIONS OF THE FEDERAL FOREST SERVICE

Chairman Hartley, of Forest Relations Committee of American Mining Congress, Submits Important Report by His Committee—Fostering of Mining Industry in Sections Now Avoided by Prospectors Is Plan

So much misunderstanding has resulted from the regulations of the Forest Service governing prospecting in national forests that the Forest Relations Committee of the American Mining Congress has decided to undertake a general campaign to make these regulations clear and to encourage prospecting in national forests. The following report has just been made by Carney Hartley, the chairman of this committee:

With a very optimistic feeling in the mining industry, with the price of all the metals at a high stage and a better appreciation of the industry by the investing public, it is reasonable to expect that during the coming season there will be a marked revival in prospecting. In some quarters, at least, there is a misapprehension of the rules regarding prospecting on forest reserves and it may be stated almost as a general situation that the attitude of the Forest Service is not well understood by the majority of people who are interested.

Broadly speaking, the same condition holds for prospecting on the forest reserves as on any public land, but rules are laid down by the Forest Service for the preservation of timber and as regards fires and such like and these must be observed as well by the prospector as by any casual visitor.

This is the only limitation which is imposed, and the committee on Forestry Relations of the American Mining Congress is endeavoring to render a service in making the situation plain to the prospector and in case of any difficulty with the local forest officials, to do everything it can in adjusting them.

The prime object of this work is, of course, to foster the mining industry by furnishing to prospectors information regarding the rules of the Forest Service and to make this as definite and conclusive as possible, to try and adjust differences which have already arisen by taking up the case with the headquarters in Denver and if necessary with the Chief Forester in Washington.

This Committee will not do any legal work but will use every consistent endeavor to carry out the work outlined upon receipt of a statement of the facts of the case, which it should always be remembered, will have to meet a similar statement made by the local forest official.

It would appear to the Committee that its best results can be reached by furnishing information in advance of any work, so that parties going on a reserve may be fully informed of what they may or may not do. It would, therefore, urge intending prospectors to take up the question at as early a date as possible and inform themselves fully so that there may be no difficulties or misunderstanding regarding their rights.

Please bear in mind that the Forest Service has headquarters in Denver, making it very convenient to get definite and conclusive information, as the Committee headquarters is likewise there.

It is hoped that this information will be generally passed along, as it is obviously impossible to reach the individual.

VALUABLE RECORD BEING MADE IN POTASH WORK

There has been no cessation in the determined efforts being made by the United States Geological Survey in its potash work. While the work is naturally painstaking and slow, there is no doubt that much valuable experimentation is being placed on record. Green sand marls are being investigated in different parts of the United States. W. C. Phelan, of the Geological Survey, just has completed investigations of marls in New Jersey and Delaware. He took numerous samples of the deposits and finds them exceedingly well located with regard to transportation and market.

Of course, the big question to solve is whether the potash content can be extracted profitably. These marls also contain potash and lime. They have been used as fertilizer in the states where they occur for many years. It is probable that the potash content as well as the phosphate is slowly soluble. The cost of extracting potash from silicates, however, is high and much depends on the mechanical treatment that may be devised.

Green sand marls have been given very little attention as a source of potash and the experimentation is being watched with great interest by chemists throughout the country.

INCREASING IMPORTANCE OF MOLYBDENUM ORES

(Continued from page 159)

PRICES AND MARKETS

Prices: Under existing abnormal market conditions it is impossible to quote exact prices for either molybdenite or wulfenite concentrates, sales of even one or two ton lots being generally the subject of separate negotiations and the prices received varying between wide limits. Based on a content of 90 per cent MoS_2, small lots of molybdenite in 1915 brought from $2,500 to $3,000 per short ton, or from $27.78 to $33.33 per 20-pound unit of MoS_2. Probably from 100 to 200 tons of wulfenite concentrates of domestic origin were sold during the year. Based on a content of 20 per cent MoO_3, the price received was reported to range from $216 to $300 per ton, or $10.80 to $15.00 per 20-pound unit of MoO_3

At present (March, 1916), the prices offered for molybdenite are about $20 per unit MoS_2, based on a content of 50 per cent MoS_2. For each per cent above or below this, 20 cents per unit may be added or deducted from the price. For example, a concentrate containing 72 per cent MoS_2 would be worth $20 + (22 x $20) or $24.40 per unt and ore containing 31 per cent. MoS_2 would be worth $20—(19 x $20) or $16.20 per unit. Prices for wulfenite and molybdenite have more than trebled in the last three years, and are at present altogether exceptional. In 1908 high-grade molybdenite concentrates containing from 90 to 95 per cent. MoS_2 brought $6.50 to $7.60 per unit, and in 1909 the price was as low as $5.60 per unit. With increased production and a more normal market the prices are sure to decline. In the past they have been normal at $6 to $10 per unit for 90 per cent MoS_2. In September, 1915, the Australian Government fixed by law the maximum price for high-grade molybdenite concentrates at 105 shillings per unit (22.4 pounds), which is equivalent to about $22.81 per unit (20 pounds). In March, 1916, English quotations on ferro-molybdenum containing from 70 to 80 per cent molybdenum were about 15/6d., or $3.77, per pound.

How Molybdenum Concentrates are Bought and Sold: The basis upon which molybdenum ores and concentrates are bought and sold varies according to whether the contained molybdenum mineral is molydbdenite or wulfenite. Molybdenite products are invariably purchased on the basis of their molybdenum content, reckoned as MoS_2, whereas wulfenite is bought either on the basis of its content of metallic molybdenum, or as MoO_3.

One part by weight of MoS_2 is equivalent to 0.9 part of MoO_3 and 0.6 part of Mo; inversely, one part by weight of Mo is equivalent to 1.5 parts of MoO_3 and 1.67 parts of MoS_2.

In the United States the short ton of 2,000 pounds and the unit of 20 pounds are used in buying and selling molybdenum ore, whereas in Europe, the long ton of 2,240 pounds and a unit of 22.4 pounds are generally used. Quotations are usually made on a sliding scale to cover various grades of material. Specifiications generally state the minimum percentage of MoS_2, MoO_3 or Mo in the ore or concentrates that is acceptable, and also the maximum allowable percentage of objectionable elements, such as copper, tungsten, bismuth, arsenic, and antimony. Just what are objectionable elements depends largely on the use to which the molybdenum product derived from the material is destined, and the methods employed in treating it. Copper is particularly undesirable, and more than 2 or 3 per cent of it usually renders even high-grade material unmarketable.

Up to 1914 it was difficult to sell molybdenite concentrates containing less than 80 per cent MoS_2 or wulfenite concentrates with less than 25 per cent MoO_3, but at present, March, 1916, it is reported that concentrates containing as low as 20 per cent MoS_2 and 18 per cent MoO_3 respectively, can be marketed.

TREATMENT OF ORES

Concentration: Of the two commercial ores of molybdenum, namely, molybdenite and wulfenite ores, the first are not amendable to the ordinary processes of concentration by jigs, tables, vanners, etc., such as are usually employed in treating ores of copper, lead, zinc, gold and silver, as the grains or flakes of molybdenite, even when of considerable size, float readily on water, and therefore are lost if these methods are employed. On the other hand, little difficulty is experienced in the adaptation of the ordinary jig and table processes to wulfenite ores, as wulfenite is readily wetted, and because of its high specific gravity (6.7 to 7), it is much heavier than the gangue minerals which accompany it.

Concentration of Molybdenite Ores: The methods of concentration that have been used with success with molybdenite ores may be grouped into three general heads, as follows:

1. Rolling and screening processes.
2. Electrostatic methods.
3. Flotation processes.

Rolling and Screening Processes: Rolling and screening processes consist of crushing the ore in rolls to flatten the molybdenite masses into flakes, the maximum diameters of which are in excess of those of the particles of the accompanying gangue mineral, and then separating them from the gangue by screening. The process is, of course, applicable only to ores in which the molybdenite occurs in fairly large masses and flakes, and even with this type of ore the fines are generally treated either by electrostatic of flotation methods.

Electrostatic Processes: Electrostatic processes of separation depend upon the difference in conductivity between minerals which are relatively good conductors, such as molybdenite, calcopyrite, pyrite, pyrrhotite, etc., and poor conductors, such as quartz, feldspar and most silicates, calcite, etc. For the successful application of electrostatic methods a molybdenite ore must be one in which the individual particles of molybdenite are of fair size and in which the gangue and other principal associated minerals are nonconductors. The main requisite in the treatment of the ore is that it be perfectly dry and warm. Ore as coarse as 6-mesh and as fine as 200-mesh may be treated successfully, but the best results are usually obtained with coarse material.

Flotation Processes: Molybdenite has the property, common in a varying degree to most metallic sulphides, such as chalcopyrite, sphalerite, galena and pyrite, of not being wetted readily by water, and when dry and in small particles, of floating on a water surface. Moreover, like these sulphides it is eas- crushed ore and water oils have a preferential wetting action for particles of molybdenite, ily wetted by most oils; further in a pulp of as against most particles of gangue minerals, such as quartz, and this selective wetting action is decidedly increased if the water is slightly acidified. Particles of molybdenite so wetted with oil are covered with a buoyant water-repelling coating that materially assists their flotation.

The reasons for many of these phenomena are not clearly understood, but they are the basis of all commercial flotation processes. In many of the oil processes the area of the effective surface of flotation is increased by the liberation of bubbles of gas or air in the liquid, the surface of each bubble acting in the same way as the horizontal surface of a liquid at rest. These bubbles may be of air, and may be produced by violent agitation of the pulp, or by releasing the air from solution in the liquid by a reduction of pressure, or they may be of carbonic acid gas formed by the action of sulphuric acid on limestone or other carbonates or by other means. No description of any particular flotation process will be given here. It suffices to say that flotation processes in general have a wider range of application in the concentration of molybdenite ores than either rolling and screening or electrostatic processes, and it is by means of flotation that the most successful work is being done at present in the concentration of molybdenite ores.

Concentration of Wulfenite Ores. As already stated, the treatment of wulfenite ores presents few difficulties. As even the finest particles of wulfenite are readily wetted, the sliming of the ore does not occasion the considerable losses that would occur under similar circumstances in the treatment of most metallic suphides such as galena and calcopyrite, as these minerals float readily when finely divided. On account of the high specific gravity of wulfenite, it is readily separated from all of the gangue minerals with which it occurs. However, it is frequently associated with vanadinite (specie gravity 6.66 to 7.23) from which it cannot be separated by wet methods; also with cerussite (specific gravity 6.46 to 6.57) and anglesite (specific gravity 6.12 to 6.39) from which it can be only partly separated. Occasionally other lead minerals of high specific gravity, such as galena, pyromorphite and mimetite occur with wolfenite, and are recovered with it in the concentrates. The presence or absence of these other heavy minerals in the ore determines largely the grade of wulfenite concentrates that can be made.

STREAM DATA IN DEMAND AS WATER POWER DEVELOPS

Water in surface streams has at all times played an important rôle in the industrial and commercial development of the country. In the early settlement the rivers served not only as the principal means of communication and commerce, but also furnished power for grinding grain, carding wool, manufacturing lumber and for other industries. They also furnished a medium for transporting logs from the forest to the mills.

With the increased population and corresponding increase in commercial development came the need for better facilities for transportation and more power for industrial uses. Later came a demand for the use of water in streams for municipal supply and for irrigation, and it was found that a systematic study of the water resources of the country was necessary in order that works which depend for their success on the water in streams could be economically designed and operated.

As a result of this demand for data in regard to water resources of the country the U. S. Geological Survey started, about 25 years ago, systematic investigations of streams in order to determine their flow and obtain other information necessary for their economical development, and as a result of these investigations general information is available for practically all parts of the country.

The data collected by the U. S. Geological Survey have been used by the engineer, not only as a basis for the design of power plants, irrigation projects, municipal water supplies, and other works, but have also served as a basis for the economical operation of these works.

With the improvement of electrical transmission it became no longer necessary to use the power at the place of its generation and consequently a demand was created for data in regard to streams available for power at places far remote from where it is used.

Current Federal Legislation

To March 29. 19,111 bills have been introduced in Congress. Of this number, 5,291 are Senate bills, the remaining 13,820 are House bills.

Of the bills referred to in our last issue H. R. 153 is still under consideration by the Senate Commission on Education and Labor. Senator Martine, of New Jersey, has been chosen chairman of the committee, which will investigate the proposed bureau of labor safety in the Department of Labor.

The oil land leasing bill had not been reported out March 28, but the committee has agreed to report the bill favorably and its presentation to the Senate is simply a matter of parliamentary opportunity.

Before the committee agreed on reporting the bill very determined opposition developed to the amendment submitted by Senator Pittman, of Nevada. At first the amendment was embodied in the committee bill without opposition. Investigation proved, however, that the amendment was aimed solely at the Ferry Lake oil land tract in Louisiana. This land is now the source of contest between the federal government and that of the state of Louisiana.

After the committee had spent several days in hearing the respective arguments in regard to this affair it was decided to exclude the Pittman amendment from the bill and consider the matter further. If the committee, after its deliberations, should decide that the amendment is meritorious it will be introduced in the Senate as a committee amendment to the bill.

The House Committee on Mines and Mining is about to begin consideration of several bills pending before it. Chairman Foster is very anxious to secure as great a volume of opinion as possible in regard to the bill which he introduced providing for certain changes in the mining laws. Representative Taylor comments on this bill in another column.

Senate Bills

S. 43, relates to the location, entry and patenting of lands within the former Uncompahgre Indian Reservation in the State of Utah, containing gilsonite or other like substances.

This bill provides that lands and also the minerals therein, which were specifically reserved for future action of Congress, and the remainder of the lands within even numbered sections, containing gilsonite, asphaltum, elaterite, etc., which were, by the Act of March 3, 1903, authorized to be sold and disposed of in tracts not exceeding forty acres, shall, unless otherwise reserved, be immediately open to settlement, location, occupation and entry under all the land laws of the United States, according to the character of the lands or of the mineral deposits.

This bill passed the Senate March 9, 1916.

S. 1064 passed the Senate March 9, 1916, and referred to the Committee on Public Lands.

This bill provides for the non-mineral entry of lands withdrawn, classified, or reported as containing coal, phosphate, nitrate, potash, oil, gas, or asphaltic minerals in Alaska, reserving to the United States the right to prospect for, mine and remove such minerals as may be found upon the land.

S. 4825, by Mr. Owen, providing for the sale of the coal and asphalt deposits in the segregated mineral land in the Choctaw and Chickashaw Nations of Oklahoma. This bill provides that all coal and asphalt deposits leased or unleased in the segregated mineral land in this reservation, shall within six months after the passage of the act, be offered for sale at public auction and sold separately from the surface, under rules and regulations to be prescribed by the Secretary of the Interior, and approved by the President. The bill provides that the sale of such deposits be thoroughly advertised, and offered for sale in tracts of not less than 960 acres, and requires that 20 per cent of the purchase price shall be paid in cash and the remainder paid in four equal payments from the date of sale, all deferred payments bearing interest of 5 per cent, which shall become due before the expiration of four years after the first sale. The bill also provides for the appropriation of $35,000 out of the Choctaw and Chickasaw funds in the Treasury, to pay expense of advertisement, and that the proceeds derived from the sales shall be paid into the Treasury of the United States to the credit of the Choctaws and Chickasaws.

S. 4874, by Mr. Newlands. This bill provides for the establishment of experiment stations in engineering and in other branches of the mechanic arts in connection with the colleges established in the several States and Territories under the provision of an act approved July 2, 1862.

This bill proposes the establishment under the direction of the landgrant college in each State or Territory established, experiment stations, which shall conduct original researches to verify experiments and to compile data in engineering and in the other branches of the mechanic arts, and to conduct researches, investigations, and experiment in connection with the production, transportation, extraction and manufacture of substances utilized in the application of engineering and of other branches of the mechanic arts to industrial pursuits. The bill provides an appropriation of $15,000 per annum to each State and Territorty, to be specially provided for by Congress in the appropriation from year to year.

S. 4882, by Mr. Myers. This bill provides that a board, consisting of the Secretary of War, the Secretary of Agriculture and the Secretary of the Treasury, be created for the purpose of authorizing an investigation by the board of army engineers to determine the water power possibilities of the Flathead power project located on the Flathead River, near Polson, Mont., for the purpose of ascertaining whether the site is suitable for the production of cheap hydroelectric power for the operation of an atmospheric nitrogen plant, of size sufficient to supply the Army and Navy of the United States in time of war with nitric acid for manufacture of explosives. The sum of $25,000, or as much thereof as may be necessary, is appropriated to carry out the provisions of this act.

S. 5216, by Mr. Smith, of South Carolina. This bill authorizes the Secretary of Agriculture to establish, equip and conduct a plant for the manufacture of potash salts from kelp, to such extent as will make possible the ascertainment of the cost of its production in commercial quantities, and the availability of kelp as a source of supply of potash salts. The sum of $150,000 is appropriated to carry out the provisions of the act.

S. 50, by Mr. Smoot. This bill provides for applying a portion of the proceeds of the sales of public lands to the endowment of schools or the Department of Mines and Mining, and to regulate the expenditure thereof. The bill is pending before the Senate Committee on Mines and Mining.

S. 51, by Mr. Smoot, provides for the establishment and maintenance of mining experiments and mining safety stations for making investigations and disseminating information among the employes in mining, quarrying, metallurgical and other mineral industries. The bill is pending before the Senate Committee on Mines and Mining.

S. 52, by Mr. Smoot, provides for a commission to codify and suggest amendments to the general mining laws, has passed the Senate and is before the House Committee on Mines and Mining, where the majority of the committee is in favor of reporting it unfavorable to the House.

S. 725, by Mr. Warren. This bill provides for mining experiment stations in Wyoming. The bill is before the Mines and Mining Committee of the Senate and the Secretary of the Interior has submitted a report on it. He points out that since the legislation is on the statute books providing for ten mining experiment stations it is not wise to have separate bills providing for other stations.

S. 775, by Mr. Walsh, provides for encouraging prospecting, mining and treatment of radium bearing ores in lands belonging to the United States for the purpose of securing adequate supply of radium for the government and other hospitals of the United States. Since the introduction of the bill an investigation has shown that all radium-bearing ore is already in private hands. Whether the legislation contemplated by this bill would be of value is in question. Until it is determined no action on the bill probably will be taken by the Committee on Mines and Mining.

S. 776. This is by Mr. Walsh and amends Sections 2347, 2348 and 2350 of the Revised Statutes of the United States. The bill has been reported favorably by the Committee on Mines and Mining and is pending on the Senate calendar. The sections in question have to do with the payments for vacant coal lands and rights of entry.

S. 3620, by Mr. Brady. This bill provides for Mine Experiment, Mine Safety and Mine Assay Stations.

S. 4965, by Mr. Sheppard. This bill provides for mining experiment stations in Texas.

These last two bills, as well as other bills providing for experiment stations, are not approved by the Secretary of the Interior owing to legislation already enacted providing for experiment and other stations. It is unlikely that any action will be taken by the committee.

The mining experiment stations authorized at the last session of Congress, could not be established as no appropriation was made for them. It is probable that money to provide the establishment of three of the ten stations authorized will be carried in the sundry civil bill.

S. 1093, by Mr. Owen. This bill gives permission to the Denison Coal Company to relinquish certain lands embraced in the Choctaw and Chickasaw coal lands and to include within the lease other lands within the segregated coal area.

House Bills

H. R. 12426, by Mr. Hayden, authorizes mining for metalliferous minerals on Indian reservations in the State of Arizona. This bill authorizes the Secretary of the Interior to lease to citizens of the United States, or to any association or corporation organized under the laws of the United States, any part of the unallotted lands within any Indian reservation in the State of Arizona, heretofore withdrawn from entry under the mining laws, for the purpose of mining for deposits of gold, silver, copper, and other valuable metalliferous minerals, the leases being irrevocable, except as provided for in this bill, but which may be declared null and void upon breach of any of their terms. The leases under this act are for a period of fifty years, with the preferential right in the lessee to renew same for successive periods of ten years, upon such reasonable terms and conditions as may be prescribed by the Secretary of the Interior, unless otherwise provided by law at the time of the expiration of such periods. The lessee may, in the disrcetion of the Secretary of the Interior, be permitted to make written relinquishment of all rights under the lease, and upon acceptance be relieved of all future obligation under the lease.

The Secretary of the Interior is authorized to grant to the lessee the right to use during the life of the lease, a tract of unoccupied land, not exceeding twenty acres, for camp sites, milling, smelting and refining works, and for other purposes connected with and necessary to the proper development and use of the deposits covered by the lease. He also has the right to reserve to the United States the right to lease, sell or otherwise dispose of the surface of the lands embraced within such lease, in so far as the surface is not necessary for the use of the lessee in extracting and removing the deposits.

A royalty of 2 per cent of the gross value of the output of the minerals at the mine shall be paid by the lessee to the United States, for the benefit of the Indians, at the end of each month succeeding that of the extraction of the minerals from the mine, and an annual rental, payable at the date of such lease, and annually thereafter, on the area covered by the lease, at the rate of twenty-five cents per acre for the first year, fifty cents per acre for the second, third, fourth and fifth years, and one dollar per acre for each and every year thereafter during the continuance of the lease, except that such rental for any year shall be credited against the royalties as they accrue for that year. In addition, it is provided that the lessee shall spend not less than $100 per year in development work for each mining claim located or leased. All moneys received from royalties and rentals under the provisions of this act shall be deposited in the United States Treasury to the credit of the Indians, to be used for their education, support and civilization.

H. R. 12341, by Mr. Wickersham, appropriating $750,000 for the further construction and maintenance of military and post roads, bridges and trails in Alaska.

H. R. 12994, by Mr. Carter, of Oklahoma, authorizing the Director of the Bureau of Mines to collect and publish statistics on the production, manufacture and marketing of crude petroleum. The data shall embrace the number of wells drilled, location, log, production, total amount of products, accurate information concerning every well drilled for the purpose of developing petroleum in the United States, and any other information of benefit and value to oil production.

H. R. 12778, by Mr. Britten. This bill provides for a national committee on public works and for the development of water power on navigable streams and on the public lands and the use of public lands in relation thereto and for the development of the rivers and harbors of the United States.

H. R. 12779, by Mr. Britten. This bill provides for an export tax on gasoline. The tax is fixed at 50 cents per gallon. The Commissioner of Internal Revenues is empowered to make all necessary regulations to make effective the provisions of the act.

H. R. 6884, by Mr. Carter, of Oklahoma. This bill authorizes the Secretary of the Interior to adopt resolutions concerning payment of advance royalties on coal leases in the Choctaw and Chickasaw Nations. The bill reads as follows:

"That in all cases where two or more leases of coal or asphalt lands of the Choctaw and Chickasaw Nations, made by the mining trustees of said Choctaw and Chickasaw Nations, pursuant to the authority of Section 29 of an Act of Congress, approved June 28, 1898, entitled 'An act for the protection of the people of the Indian Territory and for other purposes,' are held by the same lessee, the Secretary of the Interior is authorized, in his discretion, to credit and apply the total royalty due upon the aggregate production of all of the said leases so held, the advance royalties, whether already paid or accruing thereunder in the future."

UNUSUALLY SEVERE WINTER REPORTED THROUGHOUT ALASKA

Reports received by the U. S. Geological Survey from Alaska are to the effect that an unusually cold winter has been experienced throughout the Territory. It is said to have been one of the coldest winters on record in the Yukon region.

Owing to the unusually mild winters for several years, it had been claimed in some circles that a change had taken place in the direction of the Japan current, resulting in a permanent climatic change in Alaska. Any theory of this kind, however, is exploded by the unusually severe winter which just has been experienced.

Owing to the unusual amount of ice in the Yukon, the opening of the river will be later this year than usually is the case. The Survey parties hope to be able to descend the river early in June.

The severe cold has extended even to southern Alaska. Juneau has had a winter which has sent the thermometer to fifteen degrees below zero, which is unusually cold for that region. Sitka and Kamchatka have had temperatures as low as seven degrees below zero. This is the coldest winter of any year since 1898 the records at these cities show.

Current Traffic Developments

A decision in favor of the complainants has been handed down by the Interstate Commerce Commission in the case of Weston Dodson & Company, Incorporated, and Charles M. Dodson & Company *vs.* Central Railroad Company of New Jersey.

With regard to the ruling, Chairman McChord made the following statement:

Complainants, Weston Dodson & Company, a corporation, and Charles M. Dodson & Company, a partnership, composed of Charles M. Dodson, the estate of Weston Dodson, deceased, the estate of T. M. Dodson, deceased, the estate of Samuel Adams, deceased, Frank C. Stout, E. L. Bullock, and A. S. Schropp, filed their complaint herein March 28, 1914, in which it is alleged that rates charged by the defendant for the transportation of anthracite coal from the Beaver Brook Colliery and from other collieries in the Lehigh anthracite coal region of Pennsylvania to tidewater at Elizabethport, N. J., for reshipment by water, were unreasonable and unjustly discriminatory, and reparation is asked on shipments moving within two years prior to the date of filing the complaint.

The rates herein stated apply for gross or long ton of 2,240 pounds. The rates paid by complainants which are the subject of this complaint are:

On prepared sizes	$1.55
On pea	1.40
On buckwheat No. 1	1.20
On buckwheat Nos. 2 and 3 and smaller sizes	1.10

Complainants sell coal in direct competition with other operators and dealers who mine or buy from mines in the same general region.

In Meeker & Co. *vs.* Lehigh Valley R. R. Co., 21 I. C. C., 129, the commission prescribed rates over the line of the Lehigh Valley Railroad Company from the Stevens Colliery to tidewater at Perth Amboy, N. J., for reshipment by water, of $1.40 on prepared sizes, $1.30 on pea, and $1.15 on buckwheat. The distance from the Beaver Brook Colliery to Elizabethport is 140.5 miles and from Coleraine slightly greater. The distance, for which the rates in the Meeker case, supra, were prescribed, is 164 miles. The lines of the defendant and the Lehigh Valley are but a short distance apart and extend in the same general direction.

The Lehigh Valley and other roads in the territory from which complainants ship maintain lower rates for the same or longer distances than the rates of defendant. The earnings of the defendant from those rates complained of, assuming an average loading per car of 39 tons, are 43 cents per car mile on prepared sizes, 39 cents on pea sizes, 33.3 cents on buckwheat No. 1, and 30.7 cents on smaller sizes. By stipulation testimony in the anthracite investigation relating to the cost of moving coal from the mines to tidewater was made a part of this record. This shows that the average operating cost per gross ton to the defendant for transporting coal from the Lehigh region was 44.35 cents. In Red Ash Coal Co. *vs.* C. R. R. of N. J., 37 I. C. C., 460, and Rates for Transportation of Anthracite Coal, 35 I. C. C., 220-264, it was found that these cost figures were substantially accurate.

This defendant insists that the rights of complainants should not be differentiated from those involved in Rates for Transportation of Anthracite Coal, supra. In that case the commission prescribed, from a group which includes the points from which complainants ship, rates to Elizabethport when consigned free on board vessels or for reshipment by water as follows:

Prepared sizes	$1.45
Pea size and smaller	1.35

Complainants filed herein exhibits giving details of shipments and dates when the charges under the existing rates were paid. These exhibits the defendant was given the right to check and their accuracy has not been questioned. Upon the record herein we find:

(1) That during the period from May 31, 1912, to July 31, 1914, inclusive, complainants Charles M. Dodson & Company made certain carload shipments of anthracite coal from Beaver Brook colliery and Coleraine colliery to Elizabethport, N. J., for transshipment by water.

(2) That such shipments aggregated 47,342.27 gross tons prepared sizes and 1,119.01 gross tons pea size.

(3) That complainants Charles M. Dodson & Company paid and bore thereon the established tariff rates of $1.55 on prepared sizes and $1.40 on pea size.

(4) That said rates so paid were excessive and unreasonable to the extent that they exceeded $1.45 on prepared sizes and $1.35 on pea size, which latter would have been reasonable rates for the service.

(5) That complainants Charles M. Dodson & Company were injured and damaged by the payment of said unreasonable rates to the extent of the difference between the amount paid at the rates herein found unreasonable, and the amount it would have paid at the rates herein found reasonable and that the damages amount to $4,790.18, together with interest at 6 per cent from September 1, 1913.

(6) That during the period from January 20 to January 31, 1913, inclusive, complainant Weston Dodson & Company made certain carload shipments of anthracite coal from Coleraine colliery, Pa., to Elizabethport, N. J., for transshipment by water.

(7) That such shipments aggregated 228.14 gross tons prepared sizes, upon which said complainant Weston Dodson & Company paid and bore the established tariff rate of $1.55.

(8) That said rate so paid was excessive and unreasonable to the extent that it exceeded $1.45, which latter would have been a reasonable rate for the service.

(9) That complainant Weston Dodson & Company was injured and damaged by the payment of said unreasonable rate to the extent of the difference between the amount paid at the rate herein found unreasonable and the amount it would have paid at the rate herein found reasonable, and that the damages amount to $22.81, together with interest at 6 per cent from February 27, 1913.

Upon these findings we conclude that an order should be issued authorizing and directing defendant to pay to complainants the amount of the damages by them respectively sustained, together with interest thereon. An order will issue accordingly.

Upon this record we are unable to find that the rates complained of on sizes smaller than pea are unreasonable. As the rates herein found reasonable have been ordered to be published and to be maintained as maximum for the future in Rates for Transportation of Anthracite Coal, supra, no order as to the maintenance for the future of the rates herein found reasonable need be made in this case.

Increases Coal Rates

Following 1915 Western Rate Advance Case, 35 I. C. C., 497, 603-611, proposed increased rates on bituminous coal from Illinois mines and other points to points west of the Mississippi River are found justified by the Commission.

A portion of this decision reads as follows:

"The increased rates proposed on bituminous coal affect the identical territory that was affected by similar increases found justified in The 1915 Western Rate Advance Case, supra, and the justification offered in that case is repeated here. Many of the increases were not protested. The Southern Coal, Coke & Mining Company and the Ayrshire Coal Company protested the increases proposed in certain tariffs of the Illinois Southern Railway and of the Southern Railway Company's St. Louis-Louisville divisions, and other coal dealers and shippers appeared at the hearing to join in the protests.

"Illinois Southern Railway tariffs I. C. C. Nos. 640, 641, and 642 were suspended until December 29, 1915. Increased rates were proposed in them analogous to the rates from the same general territory and to the same points that were found justified in The 1915 Western Rate Advance Case, supra, and are justified by respondents in the same way. A witness for the Illinois Fuel Company argued that his company is located in the so-called inner group of southern Illinois coal mines and, being nearer to the points of destination involved, should be subjected to slighter increases than had been made from the outer group. The two groups are described in The Illinois Coal Cases, 32 I. C. C., 659, 663, 676, 682. The proposed increases now before us merely preserve the previous relationship between the rates from the two groups.

"Southern Railway tariffs I. C. C. Nos. C-1665, C-1666, and C-1667 proposed increases from points on the Southern Railway which would harmonize with the rates heretofore found justified from points on the Illinois Central Railroad and the rates herein found justified from points on the Illinois Southern. The facts stated in connection with the rates proposed by the Illinois Southern apply equally to the rates proposed by the Southern.

"Litchfield & Madison Railway tariffs I. C. C. Nos. 123, 124, and 125 proposed increased rates that would conform generally to the increased rates heretofore made by other carriers. The increases are not protested, and the order suspending the tariffs proposing them expired December 29, 1915.

"We find that the increased and proposed increased rates on bituminous coal have been justified."

Complaint Dismissed

In the cast of Bennett & Son *vs.* Chesapeake & Ohio Railway Company, the following decision was rendered:

1. Rates for the transportation of bituminous coal in carloads from the Kanawha and New River districts in West Virginia to Culpeper and Manassas, Va., not found unreasonable, and the complaint dismissed.
2. The inhibition of the long-and-short-haul clause of the fourth section is not restricted to movements over the line of a single carrier, but extends to transportation over routes in which one or more carriers participate.
3. The defendants' fourth section applications which seek authority to continue lower rates on coal from the Kanawha and New River districts to Alexandria, Va., and Washington, D. C., than to Culpeper and Manassas, Va., granted in part.

Test Found Reasonable

In the case of the National Petroleum Association *vs.* Atchison, Topeka & Santa Fe Railway Company upon complaint alleging that the requirement that tank cars employed in transporting inflammable liquids shall be subjected to an interior cold-water pressure test of 60 pounds per square inch is unreasonable, unnecessary, and operates to the injury of complainants, the Commission held:

1. That the primary purpose of the test, prescribed after an extended investigation, is to insure, in a measure, the strength and stability demanded of containers employed in the transportation of these inherently dangerous commodities.

2. That the prescribed degree of the pressure test represents the best judgment of experienced tank-car builders and technical experts, and is more reliable and contributes to a greater degree of safety than would a less rigorous test.

3. That the rule is a regulation of the use of instrumentalities of commerce employed in a dangerous service, and, being otherwise reasonable, does not, because of the fact that it entails some expense upon the owners and operators of tank cars, impose an unjust burden upon them. The complaint was dismissed.

Found Discriminatory

In the case of the South Canon Coal Company *vs.* Colorado Midland Railway Company, the rates on bituminous coal in carloads from South Canon, Colo., to destinations in Wyoming, South Dakota, Nebraska, and Kansas were found to be unjustly discriminatory in so far as they exceed the rates from Walsenburg, Colo., to the same destinations by more than 25 cents per net ton. The rates from Cameo, Colo., were not shown to be unjustly discriminatory.

Must Reweigh Cars

In the case of the Detroit Coal Exchange *vs.* Michigan Central Railroad Company and Grand Trunk Western Railway Company, upon complaint that the rules and charges governing the weighing and reweighing of carload freight in Detroit, Mich., are unreasonable and unduly preferential, the Commission held:

1. That the Commission has jurisdiction of the weighing service, when the freight is moved in interstate commerce.

2. That it is the duty of the delivering carrier, upon reasonable request, to reweigh carload freight which has been transported in interstate commerce.

3. That the present charges for this service in Detroit, Mich., are unjust and unreasonable. Just and reasonable charges prescribed for the future.

4. That the inability of carriers participating in the interstate transportation of a car to agree upon their respective assumptions of costs for reweighing when such reweighing develops a shortage in excess of the limit of tolerance can not be used to increase charges against the shipper.

Find Rate Unreasonable

In the case of the Picher Lead Company *vs.* Missouri Pacific Railway Company, the rate of twenty-one cents per 100 pounds charged for the transportation of fire-clay retorts in carloads from Altoona, Kans., to Joplin, Mo., was found to have been unreasonable to the extent that it exceeded eight cents per 100 pounds. Reparation was awarded.

Hearings Scheduled.

Cases of interest to the mining industry will come before the Interstate Commerce Commission as follows:

April 7—Oral argument in Washington. No. 6210. In the matter of rates on iron ore in carloads from Lake Erie points to Points in Ohio, West Virginia and Pennsylvania.

April 8—I. & S. 740. Coal to Missouri stations.

April 13—Oral argument in Washington. I. & S. 755. Illinois and Indiana coal.

April 14—Oral argument in Washington. Coal Operators Traffic Bureau of St. Louis vs. Terminal Railroad Association of St. Louis.

PERSONALS

Clarence Hall, a widely known chemical engineer, of Pittsburgh, was in Washington last month on business. Mr. Hall formerly was with the United States Bureau of Mines, and is now a member of the firm of Hall and Paul, consulting engineers, Pittsburgh.

Charles S. Keith has returned to his home in Kansas City, Mo., after a business trip in the East.

W. F. Horton, a mining technologist of the Bureau of Mines, has resigned to accept services with the Sterling Steel Company.

Gordon Surr, assayer and analyst, of San Bernardino, Cal., is now connected with the University of California citrus experiment station at Riverside.

Prof. Waldemar Lindgren, formerly of the U. S. Geological Survey, and now head of the Department of Geology in the Massachusetts Institute of Technology, lectured on the teaching of Geology before the Phi Beta Kappa Society of Washington, at the University Club, banquet, February 26.

B. Bryan, of Washington, D. C., expects to go to South America this month for further geological reconnaissances. His work will be done on the west coast for the most part.

Dr. Ralph Arnold came from New York to Washington and Mrs. Arnold came from California to attend the Pick and Hammer banquet, February 26.

Dr. Arnold was formerly a member of the United States Geological Survey staff. He still does special work for the Survey and the United States Bureau of Mines. He is a trustee of Stanford University.

Chester W. Washburne, formerly with the United States Geological Survey has returned to the United States after two years in the Belgian Congo where he went to prospect for oil for the Forestiére et Minière du Congo Belgique. Mr. Washburne also did some work in Portugal, Spain and northern Africa before returning. He reached Washington February 26, in time to attend the Pick and Hammer banquet.

J. E. Spurr recently made a journey to the Hudson Bay region, several hundred miles beyond the railroads. From there he went to Nicaragua. He was in Washington February 28.

C. P. Dam left for Lillouet, B. C., by way of New York, March 1. He is taking two Empire drills with him to test gold bearing gravels about 40 miles from Lillouet. The snows have been very heavy according to reports received by Mr. Dam. Two and one-half feet fell during a four-day blizzard, upon four and one-half feet of packed snow which already covered the ground.

W. A. Bechtel, of San Francisco, who is interested in irodosmine and platinum bearing placers in Coos County, Ore., was in Washington recently.

Dr. Guestaro Mann, formerly a professor at Tulane University, New Orleans, was in Washington during a part of last month. Dr. Mann is interested in the problem of cracking oils.

Van H. Manning, Director of the Bureau of Mines, was in New York the latter part of March conferring with the officials of the American Institute of Mining Engineers, with regard to the contrinuance of the cooperation which that organization has been giving the Bureau.

B Britton Gottsberger, of Miami, Arizona, is now in the East. He was a caller at the Mining Congress office early last month.

D. W. Brunton, of Denver, Colorado, former President of the American Mining Congress, has been spending some time at Nassau, Bahama Islands, and will later go to British Columbia.

Senator Thomas Kearns, of Salt Lake City, who is making an extended trip through Central America, is expected home April 1.

Falcon Joslin, formerly a director of the American Mining Congress and president of the Tanana Valley Railroad of Alaska, who has been spending several weeks in the East, has returned to his home in Seattle. He was a caller at the Mining Congress office during the month.

James F. Callbreath, secretary of the American Mining Congress, has returned to the Washington headquarters after a trip to New York, Boston, Cleveland and Chicago, in the interest of the membership campaign being carried on by the congress.

Eli T. Conner, a mining engineer, announces the removal of his principal office from Philadelphia to 26 Liberty Street, New York.

J. F. Erisman, of the Blue Flag Mining Company, of Denver, has been spending some time in the East. He recently was a caller at the office of the Mining Congress, and expressed his very high appreciation of the MINING CONGRESS JOURNAL, as a magazine of great usefulness to the industry.

Falcon Joslin, of Fairbanks, Alaska, and New York, spent several days in Washington early in the month.

Dr. Henry Mace Payne is again in New York, after a long absence on professional business in Siberia.

B. Britton Gottsberger, of the Miami Copper Company, of Arizona, has been spending some time in the East, in conference with J. Parke Channing, president of the company. Mr. Gottsberger expects to return to Arizona by way of Washington.

GEORGIA BAUXITE DEPOSITS BEING WORKED ACTIVELY

Bauxite deposits in Georgia are being worked with great activity. W. C. Phalen, of the Geological Survey, is engaged compiling some data secured on a visit to Wilkinson and McIntyre Counties. None of this ore is reduced in Georgia. Most of it is shipped to chemical factories in the East and reduced to alum. Some small proportion finds its way into metallic aluminum. Georgia bauxite is in considerable demand as it is a source of an excellent grade of alum which is considerably sought after by paper makers. Some of it also is used for clarification of water and as the mordant in dyeing.

THE MINING CONGRESS JOURNAL

LIBRARY
UNIVERSITY OF TORONTO

SAFETY—EFFICIENCY—CONSERVATION

VOL. II

No. 5

MAY, 1916

Dr. Martin D. Foster
Who discusses mining law revision in this issue

PUBLISHED BY
THE AMERICAN MINING CONGRESS
PUBLICATION OFFICE
MUNSEY BUILDING WASHINGTON, D. C.

$ 2 00 PER YEAR 20 ¢ PER COPY

WILMOT ENGINEERING CO.

Works, White Haven, Penna. HAZLETON, PENNA.

MANUFACTURERS OF

HIGH GRADE MACHINERY

FOR THE PREPARATION AND HANDLING OF

ANTHRACITE COAL

WILMOT RIVETLESS CHAINS for Conveyors for Elevators for Car Hauls

LLOYD COMPOUND (HOLLOW GROUND TOOTH) **ROLLS**

PARRISH Flexible Arm **SHAKERS**

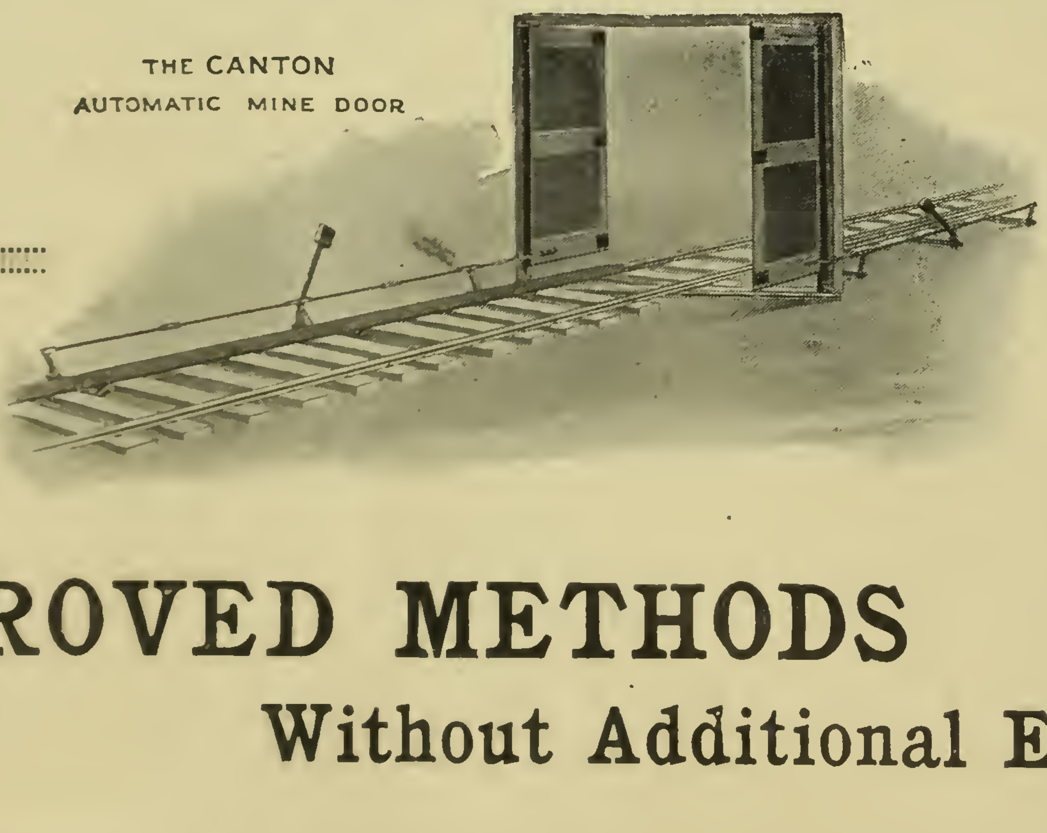
SIMPLEX JIGS

handling
crushing
screening
cleaning

BEST SERVICE—LONGEST LIFE—LOWEST COST OF UP-KEEP

Let us figure with you on your new installation or replacing your old and obsolete ones

---



IMPROVED METHODS

Without Additional Expense

IF you contend for old time methods, you might try keeping time by employing a boy with a hammer and gong, to strike off the hours as indicated by a sun dial. ¶ A trial, however, will convince you that a good clock is cheaper and more reliable. ¶ So is the Canton Automatic Mine Door better than a trapper boy. ¶ Write for literature.

THE AMERICAN MINE DOOR COMPANY, Canton, Ohio

VOL. 2, NO. 5 WASHINGTON MAY, 1916

THE MINING CONGRESS JOURNAL

Official Organ of the American Mining Congress

DR. MARTIN D. FOSTER URGES ALL MINING MEN TO CRITICIZE HIS BILL

Chairman of House Committee on Mines and Mining Believes Mining Laws Can Be Revised Without Delay and Uncertainties of a Commission—He Discussses His Bill in Detail

Dr. Martin D. Foster, chairman of the Committee on Mines and Mining, urges that all mining men study his bill providing for the revision of the mining laws. Dr. Foster is of the opinion that a commission is not necessary to ascertain the legislation needed by the industry. He thinks all persons interested in the mining industry, whether or not they consider a committee indispensable, should be willing to give a trial to this attempt to frame a mining law without having to resort to the expense and delay of a commission. The following statement sets forth Dr. Foster's views of the bill:

The House Committee on Mines and Mining has introduced a bill (H. R. 12,275) looking to the complete revision of the existing mining laws. The committee by vote of 8 to 7 refused to approve the bill for the appointment of a commission under the belief that a revision of the mining laws could be accomplished in less time with less expense.

The new bill leaves many of the provisions of the old law unchanged and the changes proposed are along the lines and following the criticisms that have been made from time to time by persons interested in the mining enterprise.

OBJECTIONS SUMMED UP

It may be pointed out that the objections and criticisms to the existing mining laws have by various speakers and writers, been crystallized into eleven concrete objections, as follows:

1. Apex law or extralateral rights' provision should be repealed.
2. Discovery and location should not be a unit, and time should be given for discovery.
3. The number of lode or quartz locations or claims should be limited.
4. Application of present law to oil and gas is insufficient.
5. Some mineral substances are not provided for.
6. Insufficient notices and want of record of locations.
7. Statute of limitations for attacking mineral patents.
8. Right of appeal from decision of General Land Office refusing patent.
9. Right of appeal to some competent court of law in all cases of contest between rival claimants, or between a locator and the government.
10. Holding locations indefinitely without performing assessment work by collusive relations.
11. Disturbance of titles by tunnel locations.

Objection No 4 has been eliminated by what is known as the Ferris bill, passed by the House and now pending in the Senate

Objection No 5 is without merit as the matter contemplated has always been sufficiently covered in the present laws. The law as it was written May 10, 1872, expressly provides that "All valuable mineral deposits of lands belonging to the United States" are made free and open to exploration and purchase. More fortunate and more comprehensive language could not have been used, and any attempt to enlarge the scope of this language by naming or enumerating any particular minerals would be without reason

MINERALS INCLUDED

Aside from the minerals expressly mentioned—gold, silver, cinnabar, lead, tin, and copper—the statute has been held to include the following: Alkaline substances, alum, aluminum, amber, asphaltum, auriferous cement, borax, building stone, calcium phosphate, carbonate of lead, carbonate of soda, clays, coal, diamonds, fire clay, guano, gypsum, iron, iron oxide, kaolin, limestone, lustral stone, marble, mica, nitrate, oil, paint stone, petroleum, potash, rock phosphate, rock salt, salines, salt, salt springs, sand, sandstone, stone, sulphate of soda, sulphates and umber.

Objection No. 7 is groundless for the reason that in 1891 Congress passed a statute expressly limiting actions attacking patents thereafter issued to six years.

Objection No. 9 is also groundless for the reason that it has always been the law that all cases of contests between rival mineral claimants must be settled and determined by a court of competent jurisdiction and this rule applies alike to any contest over surface rights and subsurface rights. The existing law does not contemplate any "contest" between a locator and the government. The locator of a mining claim may, by the performance of the specified annual labor, hold his claim indefinitely with a title that for all practical purposes is equivalent to a patent. If he prefers he may, by making a certain amount of improvements on his claim, receive a patent therefor and on proof of a valid location and that the ground claimed contains valuable mineral deposits, and a proper certificate as to the required improvements, he is entitled to a patent. If any other person claims any right to the ground, or any part thereof, he must file his objections in the land office and commence an action to establish his claim in any court of competent jurisdiction.

The bill introduced for the reasons given makes no provisions as to these objections Nos. 4, 5, 7, and 9, except to incorporate the statute providing for limitations for attacking mineral patents, and providing for an appeal from the land office if a patent is refused.

DOES NOT REPEAL APEX LAW

The bill does not repeal what is familiarly known as the "apex law" or the extralateral rights provision of the present statutes. It was believed that a provision in the bill repealing this section of the old law would bring on a contest that might result in defeating the entire bill. It is well known that many prospectors and miners who have been and are actually engaged in prospecting, locating and operating mining claims, are strongly in favor of this extralateral rights' rule and would bitterly oppose any proposed repeal. But as shown hereafter the exercise of the right is by the bill somewhat and more definitely defined.

Objection No. 2 is regarded as the most reasonable that can be made to the existing mining laws. It was a most unfortunate provision that the location of a mining claim and discovery of mineral or "valuable mineral deposits" should be made a unit, that is, that no time should be given for making a location upon the ground for exploration and discovery of minerals. The federal statute has been supplemented by State legislation, giving thirty, sixty or ninety days in which to make a discovery of minerals after the location has been made.

The existing law limits all claims to at least 1,500 feet in length along the lode and not exceeding 300 feet on each side of the center of a vein or lode, leaving the number of claims that any one person could locate unlimited. The proposed bill permits a single locator to make not more than five locations 1,500 by 600 feet along the vein or lode, and this may be done in the way of temporary locations with each claim properly marked by monuments or otherwise and this is designated as a temporary location, and the locator is then given one year after completing his temporary location in which to make a discovery of valuable mineral deposits sufficient to justify the working of the claim. The locator must then restake his claim and he may readjust the surface boundaries so that they will include the vein or lode as discovered below the surface, and he then makes his permanent location. If he obtains a patent for one or more of such claims and is in good faith developing the claims, he is then qualified to make additional or new locations; or if he files notice of abandonment of any one claim, he is then qualified to locate another or any number of claims equal to those so abandoned.

OPTION GIVEN

In lieu of the five locations above described a locator is given the option to locate one claim 2,100 feet square—equal in area to the five smaller claims—and on such claim he may make a temporary location and is given one year in which to make a discovery of minerals of sufficient value to justify the working of the claim. In this instance he is also given the right to shift the surface lines so as to derive the greatest possible benefit from the discovery as made and with the least possible loss to the investment in making his discovery.

Sec. 2322 of the new bill, which corresponds to the section of the existing law granting extralateral rights, provides for a location 1,500 by 600 feet, to be made on the outcrop of a vein or lode where no surface explorations are necessary and where a temporary location would not be required, and the locator in such case is given the right to follow the vein on its dip beyond the vertical planes of the side lines of his location, but he cannot follow the dip of his vein into any other location made prior to the date of his own location. Neither can he follow the vein on its dip into a location made one year or more after the date of his own location, if at the time the latter location was made he was not in good faith developing and working his own claim.

These provisions meet objections 1, 2 and 3, except, as suggested, the bill does not repeal absolutely the extralateral rights' provision of the existing law.

Objection No. 6. The bill recognizes the merits of this objection and provides for filing the notices of temporary and permanent locations with the register of the proper land

(Continued on page 247)

DAVID WHITE STANDS IN THE FRONT RANK OF WORLD'S PALEOBOTANISTS

Chief Geologist of United States Geological Survey Has Done Remarkable Work In Correlating Coal Beds—He Located Pocahontas Vein on New River When All Others Failed.

By M. R. Campbell

Soon after coming to the Geological Survey in 1886, David White, then a young man fresh from Cornell University, was assigned to work with Professor Lester F. Ward, one of the best informed men on fossil plants in the country. White became interested in the fossils and was soon giving much of his time to the study of ferns, that are so common in the Coal Measures of the Appalachian region. Despite the fact that scientific men of that day regarded fossil plants as making interesting specimens for museum purposes, but as wholly unreliable for the purpose of identifying coal beds, young White thought otherwise, and the more he studied the more he became impressed with the idea that in the past, plants had progressed and developed systematically as time went on, and that the comparative ages of rocks could be determined by a careful camparison of the remains of ferns and other plants that were buried in them.

About this time Mr. R. D. Lacoe, of Pittston, Pa., offered to give to the National Museum his large collection of fossil plants, if the Museum would label and correctly classify them. David White was selected for this work and the handling of this immense collection gave him an excellent opportunity to extent his knowledge of fossil plants. When this work was completed, he was sent by Dr. Walcott, then Chief Geologist of the Survey, into the coal fields to test in a practical way his ideas regarding the development of the ancient plants that formed the coal. It was in 1894 that White joined the party in charge of the writer in the coal fields of West Virginia, and the friendship then begun has continued and indeed grown throughout almost a quarter of a century.

The writer soon became convinced that White was correct in his interpretation of fossil plants and for four years work was carried on together in the most intimate manner; White determining the identity of the coal beds from place to place by means of the fossil plants, and the writer tracing the same beds by means of their outcrops. Although the latter method would seem to be the more reliable, the writer freely acknowledges that White with his fossil plants could beat him almost every time, and soon the evidences of the senses were not regarded as reliable unless thy were confirmed by that of fossil plants.

DAVID WHITE

Noted paleobotanist

For many years a standing reward had been offered to the man who could find the great Pocahontas coal bed on New River, some thirty or forty miles away from the Pocahontas field, but none could find it. David White, by the aid of fossil plants and actual tracing of the coal bed, located this famous coal, but found that it was only a foot or so thick. This discovery settled for all time the controversy as to whether or not the coal bed shows along New River and prevented further expenditure of time and money in a useless search.

Even the most eminent geologists of the

day have had to modify their views regarding the correlation of the coal beds on New River with those of Pennsylvania, through the evidence afforded by fossil plants, but such evidence would have been of little use had not the right man been there to make the interpretation.

David White stands today as one of the foremost paleobotanists of this country and one might almost say of the world. He has earned this supremacy by the most careful and painstaking work and by a knowledge of field conditions equalled by few men of the present day. The correct interpretation of the coal beds of the Appalachian region as well as the entire coal fields of the Mississippi Valley depends largely upon his work. By many persons this may seem to have little practical value, but coal operators are beginning to realize that it is of the utmost importance for them to know what coal bed they are working and to be able to say with certainty whether or not it extends into the next ravine, the next valley, or the next county.

Charles David White was born in Palmyra, N. Y., July 1, 1862. He was graduated from Cornell University in 1886. He was Assistant Paleontologist of the United States Geological Survey from 1886 to 1894. He served the Survey from 1894 to 1900 as Assistant Geologist, and in the later year was raised to the rank of Geologist. Mr. White was made Chief Geologist November 16, 1912.

SENATOR SHEPPARD ASKS THAT LIGNITE POSSIBILITIES BE PROBED

"Greatly increased prices for petroleum products and for many chemicals necessary to the industries of the country, as well as higher prices for all fuels, demonstrate the need of investigations to ascertain how vast resources of lignite, now lying idle, may be efficiently and economically used," says Senator Morris Sheppard in explaining his amendment asking for an investigation of lignite.

"Vast regions in the West and Southwest contain little or not petroleum and little good bituminous coal. There are, however, enormous resources of "black lignite" and lignite in the Dakotas, Montana, Wyoming, Colorado, Utah, New Mexico, and Texas. These lignitic coals tend to slack on exposure, and to heat and take fire spontaneously when stored, and contain, as mined, considerable water which reduces their fuel value.

"For railroad purposes these coals are objectionable because they break into fine fragments on the grate, with the result that there is a loss of unburned coal, and sparks blown out of the stack set fire to crops, forests, and dwellings. Present uses are for stationary boiler plants, where better fuel can not be obtained, cheaply and for domestic fuel, though some of the finer lignite coal is used in reverberatory furnaces at smelting plants.

"In certain European countries, especially Germany, the amount of lignite mined nearly equals that of bituminous coal. There the lignite is largely briquetted, and the briquets sell at nearly the same prices as briquets of bituminous coal.

"Experiments made in this country have shown that certain lignites can be made into satisfactory briquets without the use of tar or other binding material, but in briquetting other lignite coals the use of a binder is necessary. The Government now has at the experiment station of the Bureau of Mines at Pittsburgh a large German briquetting press. This briquetting machine should be used for tests at some point in the lignite fields so as to reduce to a minimum the cost of transportation of the lignite tested. Further, experiments should be conducted to determine the nature and yield of volatile compounds to be obtained by distilling lignite and the possibility of using the residue from distillation as solid fuel.

"The distillation experiments would show what method of distillation and what products would yield maximum returns. These experiments should be thorough and include all possible combinations of conditions favorable to the formation of the products desired. Very little systematic scientific investigation of the distillation products to be obtained from the different lignites in the West and Southwest has been done.

"The products to be obtained may include benzol, which can be used as a substitute for gasoline in internal combustion engines or in the manufacture of a great variety of products, including dyestuffs; ammonia compounds, which can be used in the manufacture of fertilizers; and tars and pitches that can be used for a wide variety of purposes, including roofing materials, road improvement, and as binding material for fuel briquets.

"The residue left after volatile compounds have been distilled from the lignite could undoubtedly be converted into excellent smokeless fuel.

"In view of the extent of the lignite coal resources now little utilized, it is believed that the appropriation asked for the conduct of these experiments will not only prove of direct advantage to the people of the West, but will advance the industrial preparedness of the nation.

PLAINS IRON WORKS TAKES OVER F. M. DAVIS CONCERN

The F. M. Davis Iron Works Co., of Denver, has been sold to The Plains Iron Works Co., a new organization, which takes over the business established many years ago by the late F. M. Davis.

R. B. McConney will continue as general manager, a position held by him for several years.

WEST MUST BE CONSTRUCTIVE IN CRITICIZING LEASING LEGISLATION, SAYS STEARNS

Denver Manufacturer Submits Suggestions for Law That Might Meet With Approval of People in Public Land States—Declares Present Water Power Legislation Is Foolish

L. T. B. Stearns of the Stearns-Roger Manufacturing Company, of 1718-1720 California Street, Denver, writes J. F. Callbreath, secretary of the American Mining Congress, as follows:

"I read the article on page 186 of the April MINING CONGRESS JOURNAL; and it is good. I assume you wrote it.

"My ideas are somewhat indefinite on this proposition, but I appreciate the request you make is necessary.

"We of the West who oppose the present proposed leasing system, should substitute some constructive leasure. It is easy enough to knock down, and object, and oppose. Briefly, I would suggest:

"1. That the information in the possession of the Government be tabulated, and that all of these public lands be valued on a reasonable basis.

"2. That they be thrown open to permanent entry, provided people are willing to pay the price asked by the Government.

"3. That suitable laws, following the natural method of development of the various kinds of mineral deposits, be framed, which will be clear and distinct; and for that purpose the different deposits should be classified. For instance, the placer law that exists today is not quite applicable to the development of oil and gas.

"I would suggest that locations be permitted to be filed in the regular way, and that these locations be allowed to remain in the possession of he locator for a reasonable length of time, say, one year. This would give the party possession while drilling, and if discoveries be made, then the party be allowed to go ahead and patent, and the Government charge the party the price per acre which had been previously established on this particular land, as suggested under heading (1) hereinabove.

"At the end of the period (of one year, or whatever may be decided), if no discoveries be made, or no work be prosecuted, then the locator should abandon his right, let it revert to the Government, and lie open for a successor.

"I would frame this development law differently for coal, for phosphates, and so on. In the case of mineral claims, I would stop the old apex law completely, and go back to the vertical plane boundary plan, the same as they have in Australia, Mexico and other places.

"I would have the locators remain in possession for prospecting purposes, in the same manner as in the oil, land, say, for a year, and then put a fixed price, as suggested hereinabove under (1) per acre on this land.

"I would also restrict so that no one person or one company could take more than a certain acreage of mineral location.

"These are general suggestions. I could of course go on particularizing for a long time, but this gives you my general notion how this matter should be framed up. Whatever should be done should look towards ultimate ownership by the individual, as no form of leasing can be devised which will overcome the objections which have been justly raised against the present bills by the western people. No Federal Government should be a landlord. The land should be opened to entry and establish citizenship in the State.

"Take the proposed legislation *re* water power. How foolish it is. Every encouragement should be given to the development of water power, and I think the present laws for location, filing water rights, etc., are good. But in addition there should be compulsion on the part of the Federal Government to permit anyone wanting to develop water power to take a right of way through forest reserves or other withdrawn lands. It should not be a question of permission but should of a question of the *right* of the locator.

"I think every inducement should be held out for the development of these powers, because nothing is lost, and everything is gained."

CONTINUE FIGHT ON LEASING BILLS SAYS J. F. McCARTHY

With regard to the leasing bills and the editorial on the subject which appeared in the April JOURNAL, James F. McCarthy, of Hecla Mining Company, of Wallace, Utah, says:

"I have read with much interest the editorial in the current issue of the MINING CONGRESS JOURNAL, entitled "Leasing Bills."

"The article expresses the situation concisely. The West is opposed to the bills and offers nothing in their place. The passing of these bills, however, is, in the opinion of Westerners at least, so unfair that they should be defeated if possible. Let matters stand as they are if necessary until such time as there is a crystallization of opinion on the the subject, which takes western opinion and western interests into consideration.

"Resistance may be useless. If the bills are finally passed in the face of he opposition of the states directly interested and if the representatives of those states watch jealously the effect of the operation of such laws then if the laws are as bad as we think they will be, repeal might be easy.

"I do not believe, however, that we should withdraw our resistance as long as we think the proposed laws are bad.

Sees Beyond the Bills

Geo. E. Collins, a nationally known mining engineer, with headquarters at Denver, says: "My impression is that the crux of the matter is not so much the bills themselves, as the spirit which now dominates Congress and the Government bureaus which will apply them. I think the development of the West might be conducted on a leasing system as well as on the basis of ownership, if it were planed and administered solely with a view to the speedy and efficient development of the national resources. The trouble is that the people of the eastern States, having already reaped all possible benefit from the disposal of the public lands within their own borders, now regard the residuum of the federal lands in a different light, and desire that they should be reserved for the benefit of the nation as a whole. That would have been fair and just enough, had we started out in that direction at first. Now it merely means that the West should pay tribute to the East.

"If Congress is willing to make it clear that royalties under a leasing system shall be limited to such a basis as will cover the cost of administration, most of the objection will fall to the ground. So long as it is the intention to extract revenue from the development of the West, I think western men should oppose the leasing bills."

READERS TELL OF BENEFITS FROM MINING CONGRESS JOURNAL

A considerable number of letters are being received from readers of the Mining Congress Journal, in which they are kind enough to express their appreciation for the service which the American Mining Congress is attempting to render through its official publication.

The Journal is now well along in its second year and has developed the fact that a great deal of very useful information was not reaching operators of mines previous to its advent.

Extracts from some of the communications that have been received, apparently bear out the conclusion that the Mining Congress Journal is being appreciated by those who read it. An excerpt from one of them is as follows:

"I am very much surprised, after having read your publication for several months, to note how intimately the mining operator is interested in matters which transpire in Washington. I am impressed with the efforts that the Congress is making to further the mining industry and I quite agree with the Journal's editorial stand that so much good has been done by the comparatively small appropriations allowed mining by Congress that considerable additions should be made to the funds allotted to this work."

A caller at the office of the Mining Congress recently declared that his periodical visits to Washington are becoming necessary less frequently, due to the fact that the Mining Congress Journal keeps him well abreast with matters in Washington. Previously it had been necessary for him to visit the Capital frequently to ascertain the status of various matters in which he is especially interested.

A rather enthusiastic member, writing from the far West, says:

"It never occurred to me so forcibly until reading your journal just how much more the farmer is getting out of the government than is the mining man. I am sure that there is no one to blame for this condition but ourselves. The mining men of the United States should get together and whoop it up until Congress will have to give attention to us and the billions of new wealth we are creating every year."

An operator of a large coal mine presents the following view:

"I am glad to see you people giving publicity to the fact that there are no 'coal barons.' More than furnishing coal operators with much valuable information with regard to traffic matters, information from the statistical department of the Geological Survey and the month to month development of the coal work being conducted by the Bureau of Mines, you are in position to do splendid work in calling attention to the fact that the coal mine operator is not in such a henious class that he always should be legislated against."

A man from Utah says:

"Please let nothing slacken your activity in bringing home to Members of Congress from other than mining states that we need a general revision of the mining laws and need it badly. Our Congressmen help to pass legislation that is beneficial to other sections of the country. Why should eastern Representatives oppose legislation that concerns us only, and on which we are practically unanimous? I read with great interest in your journal an account of the hearings of Mr. Taylor's bill asking that a commission investigate the exact changes in the law which are necessary."

Tungsten Used as an Alloy

Some saw steels contain as high as two per cent of tungsten. Valves for high-powered automobiles are sometimes made from an iron tungsten alloy. Some stellite intended to replace tool steels contains several per cent of tungsten, and the alloys known as minargent, platinoid, partinium and sideraphilt are said to contain tungsten.

DR. PARSONS DEPLORES WASTE IN COKE MAKING

Wastes in the manufacture of coke in the United States were condemned by Dr. Charles L. Parsons, chief of the division of mining technology of the Bureau of Mines, in a recent hearing before the Ways and Means Committee of the House of Representatives. Dr. Parsons' statement is as follows:

"The Bureau of Mines has long been interested in the development of a by-product coke industry on account of the tremendous wastes of valuable material that are annually taking place. This ruthless waste of material valuable to the farmers of the country for agricultural purposes, to the manufacturers of the country for power, and to the whole Nation as a source of products which might be used in time of war for explosives and in time of peace for a dyestuff industry was pointed out by the bureau in 1912. The figures given there for the year 1910 showed that 63,000,000 tons of coal containing $22,000,000 worth of recoverable nitrogen were converted into coke; but only about one-sixth of this coal was treated in by-product ovens or retorts which could make the recovery of the nitrogen possible. J. D. Pennock has shown that between 1893, when the first by-product coke oven was built in this country, and 1910, 'the coke coked in beehive ovens, where the volatile nitrogen was ruthlessly wasted in fire, amounted to about 810,000,000 tons. Had this been coked in by-product ovens the volatile nitrogen of the coal would have yielded twenty-three pounds of ammonium sulphate per ton, or a total of 9,315,000 tons, which, at $60 per ton, would have had a value of $558,900,000. But this would not be all. Had this ammonia been recovered, it would have been used on the soil as a fertilizer, and the crops would have been increased fully 20 per cent and the saving would have been many millions more.'

"Mr. E. W. Parker has shown that the value of the recoverable contents of the coal made into coke in beehive ovens which was wasted in 1910 would have been between $35,000,000 and $40,000,000. If all the coke made in the United States were produced in retort ovens these would yield from the carbon now wastefully consumed, no account being taken of by-products, approximately 1,000,000 horsepower.

"It is through this use of by-product ovens that Germany has obtained the basis of both a high-explosive industry and a dyestuff industry. Through by-product ovens are obtained and recovered large quantities of ammonium compounds, which, on the one hand, are used in times of peace for agricultural purposes, and in time of war may be oxidized into nitric acid—the basic and absolutely essential chemical for the production of all of the prominent exposives used in warfare. It is chiefly from ammonia obtained from by-product coke that Germany is now procuring her nitrogen compounds by the oxidation of ammonia. Furthermore, the by-product coke industry yields large quantities of coal tar, which furnishes benzol and toluol used for the basis of most dyestuffs and a basis for the high explosives used in shells, torpedoes, and the like, as well as the naphthalene, anthracene, and most of the other compounds going into the dyestuff industry. In 1910 Germany treated about five-sixth of her coke in by-product ovens, while the United States treated only approximately one-sixth, and these figures are in a sense a measure of the degree to which the resources of each country have been developed for the production of explosives and dyestuffs.

"Since 1910 there has been a decided growth in the by-product coke industry in this country. Many by-product coke ovens have been built, and today approximately one-third of the coke produced in America is produced in by-product ovens, showing in five years an increase of something like 100 per cent. Since the foreign war began the by-product industry has received great impetus, as is naturally to be expected, and ammonium sulphate, benzol, toluol, coke, and gas from coal have been turned out in increasing quantities. It is of the utmost importance to the country that this indusry shall be mainained and developed when the present war is over.

"As has already been stated, the explosive industry and the dyestuff industry are intimately connected. The same basic products are used in both. Essentially the same basic chemicals, such as sulphuric acid, nitric acid, chlorine, bromine, acetone, and many others are required in both industries. Accordingly, the chemical industry of the country is as intimately associated with a dyestuff industry and is as intimately dependent for its future upon a dyestuff industry as it is upon the explosive industry.

"The great difficulty which the ammunition plants of this country have had to meet during the past year in order to supply the demands made upon them has been the procuring of sufficient sulphuric acid and nitric acid to carry on their work. It is at present even more difficult to secure necessary supplies of these two acids than it is to supply benzol and toluol. However, the heavy chemical industry of the country has greatly expanded in response to the demands upon it, and probably at least 1,000,000 tons more of sulphuric acid was made in this country in 1915 than in the previous year. The production of nitric acid has also increased to a previously undreamed of figure.

"The basis of nitric acid in this country is now solely the sodium nitrate known as Chile saltpeter, imported from Chile. The ammonia obtained from ammonium sulphate can now be commercially oxidized to nitric acid, and the ammonia produced in the by-product coke works would help to supply a large amount of this absolutely essential chemical if for any reason the Chile deposits should be no longer available.

"Since the explosive and dyestuff plants require essentially the same raw material, the same chemicals, and to a large extent the same apparatus for sulphation and nitration, it is a simple matter to convert any dyestuff plant into a foundation for an explosive industry such as we have at present largely developed in this country, and, conversely, an explosives industry can be turned with comparative ease into a dyestuff industry, if the price of dyestuffs is sufficient to warrant the change. The dependence of the textile industry on a home dyestuff industry has already been pointed out and need not be enlarged upon by me.

"All of these industries with the exception of the textile industry are now on a boom basis, and it is my opinion that this committee should carefully view the future. When the war is over, the output of explosives will of necessity decrease to a small fraction of the present figures. With a decrease in the explosives industry will come a corresponding decrease in the manufacture of sulphuric acid, nitric acid, chlorine, and other prominent chemicals so that a depression in the chemical industry is sure to result unless some outlet is obtained for the increased production of these chemicals incident to the present commercial conditions. A dyestuff industry appears to be the only possible outlet for the product of the chemical industries and for the apparatus and plants of the explosives industry. Unless this outlet is in some way provided, a depression in industry and a decrease in the demand for labor is sure to result. If dyestuffs are not provided before the war is over in quantity sufficient for the textile industry, it has already been pointed out that a depression in the textile industry will result even sooner.

"The plants now being built in the explosives industry, in the dyestuff industry, and, to a certain extent, in the heavy chemical industry are being erected with the idea that they will be "scrapped" as soon as the war is over. To my knowledge the estimates on the installation of most new undertakings is based on an amortization of the plant within six months or one year, in order that the plant may be paid for and scrapped when the war is over. The building up of an industry or industries on the basis of scrapping the plants shows of necessity present boom conditions to be followed unless some outlet is made with a corresponding depression.

"Accordingly, gentlemen, I feel very strongly that our national safety, our national efficiency, and our national prosperity are directly connected with some method being found by this Congress by which a dyestuff industry may be put on a permanent basis in the United States."

Frederick E Burbidge, of Spokane, has been made general manager of the Federal Mining and Smelting Co., in Idaho.

DETAILED STUDY OF OATMAN DISTRICT BEING CONSIDERED

Attention of the Geological Survey has been called to several requests reaching the American Mining Congress, asking that a detailed examination be made of the Oatman District in Mohave County, Ariz.. In this connection Director George Otis Smith says:

"The Oatman District, in Mohave County, was described about seven years ago by F. C. Schrader in Bulletin 397. I fully realize that present activity in the district warrants a second and more detailed study, and plans for this work were considered some time ago.

"The first necessary step is the making of a good topographic map; but inasmuch as all of the funds available for topographic work had already been allotted last summer when the survey of the district was under consideration, it was impossible to begin the mapping under the appropriation for the present fiscal year. An allotment of funds for an accurate topographic survey of the Oatman District will be given careful thought when plans for the coming season are being considered, and a geologist will be detailed to study the district as soon as possible after the map becomes available.

"It of course should be realized that a detailed study of the district will require considerably more time than a rapid reconnaissance examination, such as was made some years ago.

JEFFREY COMPANY INSTALLS CONTRACTORS' PLANT DEPARTMENT

The Jeffrey Manufacturing Company, of Columbus, Ohio, has recently organized a new Contractors' Plant Department to handle the sale of a line of small rock and ore crushers, with which it will furnish its well known line of elevators, conveyers and screens. The company will specialize in the manufacture of small crushers only, which will fit in with certain well established Jeffrey lines such as pulverizers, loaders and sand and gravel machinery. These machines have been developed and are particularly adapted for use in the following fields: Road building, contracting, mining, rock crushing, in connection with pulverizers, in gravel plants, and in block and tile plants.

Leroy A. Kling, formerly sales manager of the Road Machinery and Limestone Crusher Department of the Wheeling Mold and Foundry Company, Wheeling, W. Va., will be in charge of this department.

The company is interested in hearing from agents who are qualified to handle the sales of these products in their territory.

D. W. Brunton, who has been spending some time in the South, has returned to his home in Denver.

HOUSE COMMITTEE AND DELEGATE WICKERSHAM SCORED AT MINING CONVENTION

Northwest Operators Call Upon Congress to Name a Commission Forthwith to Make Recommendations as to Revision of Laws—Committee Did Wrongful Act, Says Resolution

A wrongful act was committed by the House Committee on Mines and Mining when it rejected the bill providing for a commission to recommend the changes needed in the mining laws, in the judgment of the Northwest Mining Convention, which was held in Spokane recently. Delegate Wickersham, of Alaska, was scored for the part he took in defeating this legislation. Extensive resolutions covering the revision of mining laws question were adopted by the convention. They read as follows:

Whereas, The mineral land laws of the United States and Alaska, framed nearly 50 years ago, are unsuited to present needs and have developed various evils and radical defects that seriously retard or wholly prevent the development of our mineral resources, and

Whereas, In consequence of this recognized failure of present United States mining laws adequately to meet present requirements, there is everywhere among mining men a pronounced and growing dissatisfaction, and

Whereas, Owing to the thoroughness with which our older mining districts have been surface-prospected, the discovery of the new, valuable and usually, more or less deep-seated mineral deposits is daily growing more difficult, and

Whereas, Those States that have endeavored to correct certain of the defects in the said United States mining laws have found that patchwork legislation is impracticable and that nothing constructive and permanent can be done effectively without Congressional authority, and

Whereas, Many unsuccessful attempts have been made in the past to interest Congress in this most important matter of mining law revision, now, therefore, be it

Resolved, By the 1916 Northwest Mining Convention, assembled at Spokane, Washington, that it is the conviction of this representative body of Northwest mining men that any further delay upon the part of Congress to take definite action in regard to an expert and comprehensive revision of the United States mining law must inevitably work great hardship upon the mining industry as a whole and may even threaten its future. Consequently, the convention hereby petitions that this Sixty-fourth Session of Congress appoint forthwith a mining law commission of not less than five prominent persons closely and actively identified with the mining industry and thoroughly competent to take evidence in the principal mining centers of the United States and Alaska over a period of not less than one year, and afterwards to work out, for presentation to the next session of Congress, an harmonious and thoroughly coordinated code of mining law that shall best serve and safeguard the present and future interests of all concerned.

Resolved, That it is the sense of this convention that the said commission should consist of at least one business man, one mine operator, one mining engineer and two mining lawyers, each of acknowledged ability and sound judgment; also that the members of this commission should receive such adequate compensation for their services as would justify them in devoting their entire time and energies to a solution of the numerous problems involved.

Resolved, That it is the conviction of this convention that this revision of United States mining law cannot be accomplished successfully in any other manner than in that specified above, namely, by means of a duly accredited commission, and, therefore, that the House Committee on Mines and Mining did a wrongful act in rejecting the bill providing for a commission to study and recommend such revision and that any bill arising within said House Committee on Mines and Mining will necessarily prove wholly inadequate and even more detrimental to the mining industry than are the present mining laws.

Resolved, That it is the conviction of this convention that the House Committee on Mines and Mining erred at its hearing on January 5, 1916, and thereafter, in permitting itself to be swayed by the arguments of the Hon. James Wickersham, delegate from Alaska, whose challenges of the personal motives of the distinguished petitioners appearing before the committee, as representatives of the mining men of the so-called metalliferous States, this convention believes to have been unfounded and unjust.

Vanadinite Crystals Hexagonal

Vanadinite crystals of any color are six-sided, most of them terminating in a point. Some, however, especially the larger ones, may be incomplete, but some angles will be found showing the characteristic 120 degrees between sides. Crocoite crystals are all red and do not have the six-sided form. They are more likely to be four-sided with furrows running along the sides. Although four sided they are not likely to be square.

DR. SMITH WOULD APPLY SHERMAN LAW TO CONDUCT OF PUBLIC BUSINESS

"The Coast and Geodetic Survey and the Geological Survey have much in common; the field of endeavor for each is nation wide; they are scientific in spirit and civil in organization; both are primarily field services, and the product of most of the work of each reaches the public in the form of maps," said Dr. Geo. Otis Smith in an address at the centennial exercises of the Coast and Geodetic Survey, last month. "The similarity in official names also indicates a certain overlapping of function, which, under some conditions, might cause duplication of work, but the gratifying fact is that the two Surveys have worked in the cause of American science on a coordinated rather than a competitive basis.

"Members of the Geological Survey most familiar with these large contributions have estimated that the value of the geodetic work done by the Coast and Geodetic Survey that would otherwise necessarily have been done by the Geological Survey has aggregated not less than a million dollars, and if the future work as now planned is carried to completion another million dollars will be included in the Geological Survey's total indebtedness to its elder sister.

"With full opportunity to overlap their fields of operation, to duplicate work, and thus to waste public money, there has been economical coordination rather than wasteful competition.

"In these days, when as American citizens we have so deep concern in the question of public regulation of private business, it may be opportune for some of us as public officials to pause and consider the question of regulation of public business. Do we apply the same rule to our conduct of the business of these federal bureaus that we advocate for the control of corporations? Here at the federal capital we have some two score scientific bureaus distributed through several executive departments. There exists no general plan or division of duties among these different agencies for public service, but as a fundamental policy we have pinned our faith to a sort of declaration of independence that all scientific bureaus were created free and equal, with the inevitable result that some fields of scientific investigation are occupied by two or more bureaus, other and less attractive fields shunned, and even others perhaps claimed by those not best qualified to make the largest use of the opportunity for work. This is the competitive system almost at its worst, because it is countenanced by men of scientific training and high ideals of public service.

"But first of all, we must agree that, however great its advantage as a method of stimulating progress, competition must be fair. If we are to apply the principles of the Sherman Act and the Clayton law to public business, unfair methods must be ruled out as illegal. Unrestrained competition in the public service presents some dangers, no less real than those incident to unregulated competition in private business.

"Even at its best, however, this competition system is wasteful. The public has too often found that competition as the safety valve of business costs too much in steam. If, in the branch of public business in which we are engaged, the ideal is to render the best service at the lowest cost, must there not be regulation, and regulation which recognizes that there are what we may term natural monopolies in the Government scientific service? The adoption of the monopoly system, however, involves here, as in the field of public utilities, the correlative idea of adequate regulation in the public interest.

"The possession by any bureau of even a skeleton organization of efficient specialists in a certain field would seem to be the practically unanswerable argument for entrusting to that bureau any new and enlarged work in that field whenever Congress deems larger appropriations advisable. That is the type of practical logic that is recognized in private business, for under public regulation of natural monopoly the public utility company that first enters the local field is recognized and even protected by the public service commission, as long as the service rendered is at all adequate.

"In this informal comparison of the actual and ideal in the administration of the scientific bureaus of the Government, I have had ever in mind the existence of a real basis for optimism in the splendid record of the Coast and Geodetic Survey and the Geological Survey in absolutely coordinating their endeavors in the public service."

GEOLOGICAL SURVEY DOING WORK IN THIRTY-SIX STATES

As showing the scope of current geologic work in the United States, the Geological Survey March report for the Division of Geology shows that investigations in progress during the month had directly to do with thirty-six states, and indirectly concerned Australia, Africa, the West Indies, the Cocos-Keeling Islands, Fanning Island, and the Canal Zone as well as Alaska, which last, of course, is a special field of investigation for a distinct division of the Survey. This extra work outside of the domain of the United States was incidental to the paleontologic and stratigraphic studies of the Survey specialists working on problems connected with the study of the Atlantic and Pacific Coasts.

During March six geologic reports were completed for publication by the Geological Survey as well as two scientific contributions for outside publications, while four manuscript classification reports on coal and oil lands were transmitted to the Land Classification Board in connection with the public land work of the Survey.

GOVERNMENT EXPERTS WELL KNOWN TO MINING MEN

C. E. SIEBENTHAL
Geologist

C. E. Siebenthal, geologist of the U. S. Geological Survey, who is specializing on lead and zinc resources, and who has a wide acquaintance among mining men, was born in Vevay, Ind., April 16, 1869. His ancestors were members of the Swiss colony which came to Indiana in the early days and named the county where they settled Switzerland. As the colonists came from near the town of Vevey on Lake Geneva, Switzerland, they named the new town Vevay which name it bears to this day.

Mr. Siebenthal was educated in the public schools of that place and is a graduate of its high school. Following his graduation from high school, he attended the Indiana University. Dr. J. C. Branner, one of his instructors, became director of the Geological Survey of Arkansas, and young Siebenthal, along with a number of students from the University, did work on that Survey for several summers. Later they followed their professor to Stanford University where Mr. Siebenthal graduated, being president of the first class to go out from the new university, and where he afterward obtained his A. M degree. He was also a Fellow of the University of Chicago and while there did a piece of work which attracted attention, a series of relief maps of the Chicago area showing the different stages of the Pleistocene Lake, Chicago. Later he taught in the Manual Training High School at Indianapolis, and also served on the Indiana Geological Survey. In 1901 Mr. Siebenthal began his service with the United States Gelogical Survey and has since been with this organization.

Among the principal papers which he has had published are: "Geology of Dallas County, Arkansas," "Bedford Oolitic Limestone of Indiana,"* "Silver Creek Hydraulic Limestone of Southeastern Indiana," "Structural Features of the Joplin District," "Gypsum of the Uncompahgre Region, Colorado," "Gypsum of the Laramie Basin, Wyoming," "Bentonite of the Laramie Basin," "Notes on Glaciation in the Sangre de Cristo Range, Colorado," "Joplin District Folio,"* "Mineral Resources of Northeastern Oklahoma," "Tripoli Deposits Near Seneca, Mo."* "Geology and Mineral Resources of the Laramie Basin, Wyo.,"* "Geology and Water Resources of the San Luis Valley, Colorado,"* and "Laramie-Sherman Folio."* Bulletin 606, Origin of Zinc and Lead Deposits of the Joplin Region, which has recently appeared, is the result of twelve years of intermittent field and office study of the conditions of ore deposition in the most important zinc field in the United States.

Molybdenum Widely Distributed

In general it may be stated that molybdenite is found where there are large masses of granitic rocks, though it is found in small quantity with other rocks, according to the U. S. Geological Survey. This, therefore, confines the deposits mostly to what are known as the mining States, that is, the States of the Rocky Mountains and westward. It is also found in Maine and other States which have, as stated, large areas of granitic rocks. It would be impossible to state what the percentage of the molybdenite is in the rocks in which it occurs. It may vary in all proportions from the merest trace to considerable pieces of almost solid molybdenite. Wulfenite (the lead molybdate) is found only in the oxidized portions of lead-bearing deposits. The value is uncertain and is usually a matter of bargaining between buyer and seller. The latest actual offer of which the Survey knows is $1 per pound for MoS_2 (molybdenum sulphide) in ore containing fifty per cent or more of the mineral, with a premium for richer ore and a reduction for poorer material.

---

*Co-author.

BY-PRODUCT COKE OVENS BEING INSTALLED RAPIDLY

Arrangements are being made to erect more than 500 by-product coke ovens in this country, according to the Wall Street *Journal*. In connection with this announcement that paper carries a concise account of the status of by-product development. The article reads as follows:

Manufacture of by-product coke was first begun in 1893 in a battery of twelve ovens built by the Semet-Solvay Co. at Syracuse, N. Y., and in that year 12,850 net tons of coke were produced. Today there are in existence, 1,689 Solvay ovens with an estimated maximum productive capacity of 32,035,400 tons yearly; 2,287 Koppers' ovens, productive capacity of 44,599,500 tons; 2,510 Otto ovens, productive capacity of 48,945,000 tons and 382 miscellaneous ovens with productive capacity of 6,489,000 tons, a total of 6,868 ovens, with an estimated productive capacity of 132,068,900 tons a year or 11,005,825 tons a month.

Arrangements have already been completed to increase the total number of ovens to nearly 7,400 and the productive capacity by more than 3,600,000 tons annually. The following ovens are in process of construction or will be started in the near future: A Solvay oven at Buffalo; a Roberts' oven at Canal-Dover; a battery of Koppers' ovens at Birmingham by the Yolande Coal & Coke Co., and a battery of Roberts' ovens at Granite City, East St. Louis. In addition it is said steel interests contemplate putting up two batteries of by-products ovens on the south shore of Lake Michigan, in the neighborhood of Indiana Harbor and Gary.

The Peoples Gas Co. of Chicago is also said to be contemplating the building of a large battery of ovens in Chicago. It has been practically decided to put up the largest by-product coke oven in the world at Clairton, Pa., which is in the heart of the Connellsville field. This of course will increase the potential productive capacity of by-product ovens tremendously and accordingly will increase the consumption of coal.

There are many reasons responsible for the remarkable growth of the by-product coke industry. Chief among these is the large saving effected by reducing the gases driven from the coal during the process of coke manufacture, which cannot be recovered from bee-hive ovens. About one-quarter of the coal is driven off in the form of gases which when distilled yield heating gas, illuminating gas, tar, coal-tar products, dyestuffs, ammonium sulphate, benzol, etc., etc. It is safe to assume that the perfection by American chemists of a process for the manufacture of dyestuffs from coal tar products will place the United States in a position to surpass Germany in the world's color markets. Taking, for example, Connellsville coal, which contains 62.5 per cent fixed carbon and 28.36 per cent of volatile matter, besides yielding in the by-product process 75 per cent of its weight in coke, one ton will give 10,000 cubic feet of gas, 5 gallons of tar, 20 to 25 pounds of ammonium sulphate and 1.1 to 3.8 gallons of benzol.

The value of these products is considerably in excess of $1.50 per ton of coal used, but using $1.50 as a minimum value, operating at maximum productive capacity, and using 203,504,856 tons of coal annually the by-product coke ovens of this country would have $305,257,284 annually, which would be totally lost in the bee-hive process. Were the use of the by-product oven exclusive, this saving would amount to more than $1,000,000,000 a year.

In 1914 more than 51,500,000 tons of coal were used in the manufacture of coke. The by-products from this coal represented, on a basis of $1.50 per ton of coal used, almost $80,000,000.

Comparing the bee-hive oven with the by-product oven, every advantage seems to be with the latter. The by-product ovens are permanent, whereas the bee-hive ovens are usually temporary, the former may be built in any location where the rate for the transportation of coal is not prohibitive, whereas the latter are invariably built at the coal mines and have to be abandoned when the supply of coal gives out. Chemists are discovering more and more valuable products which are recoverable from coal tar gases and economical processes for the distillation of the gases and the recovery of these products are constantly being devised. In fact, the by-product industry promises to be the more profitable part of the coke industry. Steel mills and blast furnaces are realizing the value of the by-product oven, and the marvelous growth of the industry has been the result.

ISSUES COMPREHENSIVE REPORT ON ALASKAN MINES

The report of William Maloney, territorial mine inspector for Alaska, crowds into thirty-six pages a remarkable amount of information regarding mines and mining in Alaska.

Some copies of the report are being circulated by the Bureau of Mines and are attracting much interest in Washington.

During 1915 Mr. Maloney inspected 168 placer mines, 31 quartz mines and 30 dredges. To do this it was necessary to visit the following mining districts: The Fairbanks, Hot Springs, Tolovana, Tenderfoot, Ruby, Iditarod, Seward Peninsula, Valdez, Seward and Juneau.

The report tells of the advance being made in safety work. It gives a detailed account of the accidents during the year. There were only twenty-three fatalities charged to mining in Alaska in 1915. The report contains a discussion on labor conditions and discusses briefly the status of the industry in the various mining camps in the Territory. Of particular value is the complete list of mining companies operating in Alaska.

FOREST SERVICE REGULATIONS REGARDING FIRE HELD PERFECTLY REASONABLE

Forestry Relations Committee of American Mining Congress Sends Out Instructive Circulars to Prospectors—No Permit Necessary to Prospect on Reserves—Timber May be Used for Development Work

With regard to prospecting on the forest reserves, the Mining Congress Committee having this subject in charge has isued the following statement:

"Broadly speaking, the rules relating to prospecting for mineral on forest reserves are just the same as on any public land. The occasion for any difference between the Forest Service and the prospector is usualy the result of the fact that, because the Forest Service covers its territory with the rangers, the land laws are enforced, while on public domain there is no provision for doing this and in consequence their application has been very largely lost sight of.

"All mineral land, whether on forest reserves or on other unlocated land, is under the jurisdiction of the Secretary of the Interior, while the Forest Service comes under that of the Secretary of Agriculture. The part which the Forest Service takes in connection with mineral land is merely that of carrying out a couresy of one department to another and because they have men on the ground who are available for the work. There is the advantage, however, that the Forest Service is presumed to and does go into all the facts and as far as possible adjust any differences. It is their purpose and intention to encourage development of any mineral land, in a great many cases because it is very desirable as a matter of fire protection to have the reserve occupied.

"In addition to this fact the act creating the forest reserve specifically states in the following language: '. . but it is not the purpose or intent of these provisions, or of the act providing for such reservations, to authorize the inclusion therein of lands more valuable for the mineral therein, or for agricultural purposes, than for forest purposes.'"

That the situation is fully realized is shown also by the following quotation from the act or its amendments:

"The Secretary of the Interior may permit, under regulations to be prescribed by him the use of timber and stone found upon such reservations, free of charge, by bona fide settlers, miners residents, and prospectors for mineral, for firewood, fencing, buildings, mining, prospecting, and other domestic purposes, as may be needed by such persons for such purposes; such timber to be used within the State or territory, respectively, where such reservations may be located."

"Nothing herein shall be construed as prohibiting the egress or ingress of actual settlers residing within the boundaries of such reservations, or from crossing the same to and from their property or homes; and such wagon roads and other improvements may be constructed thereon as may be necessary to reach their homes and to utilize their property under such rules and regulations for all proper and lawful purposes, including that of prospecting, locating and developing the mineral resources thereof; *Provided*, That such persons comply with the rules and regulations covering such forest reservations."

"All waters on such reservations may be used for domestic, mining, milling, or irrigation purposes, under the laws of the State wherein such forest reservations are situated, or under the laws of the United States and the rules and regulations established thereunder."

"And any mineral lands in any forest reservation which have been or which may be shown to be such, and subject to entry under the existing mining laws of the United States and the rules and regulations applying thereto, shall continue to be subject to such location and entry, notwithstanding any provisions herein contained."

From "the Use Book" it will be very evident that the policy of the Forest Service is to give anyone who goes on the forest reserve in good faith every opportunity to carry on his work to very best advantage They have, however, frequent cases to contend with where the rights are abused and the laws broken without any reason or excuse. The following is quoted from instructions to the executive portion of the Forest Service and no fair minded person can take exception to what is stated particularly when it is remembered that the work of the Forest Service is for the benefit of many thousand people for every prospector that might reasonably be expected to go on the ground

DEFINITION OF A VALID CLAIM

"A valid claim is one initiated in good faith under some act of Congress for the acquisition of title to public lands and continued by use consistent with the character of the claim and necessary for its actual development."

It is a fundamental requisite that all claims be initiated in good faith for the purpose contemplated by the law under which they are held. It is bad faith, for instance, to hold a mining or agricultural claim promarily for the timber thereon or to acquire a site valuable for water power development. Where the land is held for the timber, for a hotel site, saloon site, or other foreign use, and there has been no compliance with the requirements of the law under which the claim was initiated, it may be considered prejudicial to National Forest interests."

EXAMINATION OF MINERAL CLAIMS

"Prospecting will not be interfered with and mineral locations will not be examined prior to application for mineral patent, except where a report is requested by the Department of the Interior or where locations interfere with the administration of the National Forest. No adverse report will be submitted to the Department of the Interior which has not been made by a mineral examiner. Prospecting may be carried on without obtaining a permit from forest officers.

FREE USE OF TIMBER

"The locator, or subsequent owner, of a mining claim has a right to the use of sufficient timber from his claim for development purposes. This includes the construction of such buildings as may be necessary as an adjunct to such development and the timber for shafts and tunnels, as well as for fuel in connection with such development. Timber, however, may not be cut from one claim to be used on another claim, even if it be of the same group, unless its use tends to develop the claim from which it is cut, as well as the one on which it is used, except under free-use permit."

"A mining claimant has no right whatever to cut or remove timber from his claim for sale or for purposes other than the development of the claim, and such removal constitutes trespass, except where the removal of the timber reasonably in advance of the mining work is necessary to the development of the claim."

The law regarding the use of timber for mining purposes on any public lands states that it may be cut only from the included surface, although this is something which received very little attention from the mining public and frequently is a matter of surprise when this restriction is made on forest reserves. The quotation above, however, shows how very easy this question can be arranged when the claim is taken up where timber is unsuitable or scarce and all that is necessary is to consult the local ranger who will advise what timber may be cut. Service Regulations S 27 and S 29 quoted herewith will show how well this matter is taken care of.

REGULATION S 27

"Free use may be granted: (1) To bona fide settlers, miners, residents, and prospectors for minerals, for firewood, fencing, building, mining, prospecting, and other domestic purposes; (2) to school and road districts, churches, or noncommercial cooperative organizations of settlers for improvements of mutual or public benefit; (3) for the construction of telephone lines when necessary for the protection of National Forests from fire; (4) to certain branches of the Federal Government."

REGULATION S 29

"Permits will be required for green material."

Free-Use Areas: "Supervisors may, with the approval of the district forester, designate as free-use areas portions or all of any National Forest, and settlers, miners, residents, and prospectors for minerals may cut and remove from such areas, free of charge and without permit, under such rules as may be prescribed by forest officers, any dead timber needed for their own use for firewood, fencing, buildings, mining prospecting and other domestic purposes. No timber may be taken under this regulation for sale to other persons or for commercial use."

Emergency Use: "Material may be cut outside of a free-use area without permit in cases of emergency or of immediate need. The person taking such material shall promptly notify the forest officer in charge of the district."

Transient Use: "Small quantities of material needed by transients may be taken without permit."

Briefly stated, therefore, the situation is as follows:

No permit is required to prospect on Forest Reserves.

Timber on claims may be used freely for all necessary purposes in developing.

If additional timber is required the ranger should be consulted.

Forest Service Regulations regarding fire are perfectly reasonable and should be carefully observed.

The ranger has no option in his action in carrying out any rules prescribed and fire rules are of highest importance. In case of any uncertainty consult the ranger and if not satisfied the District Forester or write to the Secretary of the nearest Chapter of the American Mining Congress, or to the Forestry Relations Committee, 316 Colorado Building, Denver.

TUNGSTEN DEPOSITS IN U. S. BEING DEVELOPED RAPIDLY

The U. S. Geological Survey knows of no new extensive deposits of tungsten ores that have been found in the United States. There are, however, many developments of known deposits from which an increased production is being made. In the Atolia, Cal., field the known deposits have been developed greatly and numerous extensions have been found. The ore from this area is scheelite, calcium tungstate. In Arizona many new deposits have been found but they have not to date been shown to be extraordinarily large.

OKLAHOMA COAL COSTS $1.80 TO $2.00 A TON TO PRODUCE, CARL SCHOLZ TESTIFIES

President of the American Mining Congress and Other Operators Appear Before the Indian Affairs Committee of the House and Explain Mining Conditions on Indian Lands—Alderson Best Domestic Coal in United States

The situation in the coal mines on Indian lands in Oklahoma was the subject of a hearing April 14 before the House Committee on Indian Affairs. Carl Scholz, president of the American Mining Congress; P. R. Allen, vice-president District 21, Southwestern Coal Operators; Frank Drew, secretary; James McConnell, James H. Hibben, and Dorset Carter, attended this hearing, extracts from which are as follows:

Mr. Scholz. The only thing I want to touch on is the last clause of the paper read by Mr. Carter in connection with the extension of the lease. As you yourselves well know, our company operates in the Hartshorne Basin, and about ten years ago, we abolished the method of mining from the crop, believing it was not for the best interest of the owners or anybody else. Just now, we have in course of completion two mines which will cost us in the neighborhood of $250,000 each. I have taken, quite recently, the mining trustees over that property to show them the expense connected with the development of these new mines, and Mr. Willis expressed surprise at the substantial manner in which the work is being carried on. As you also know, since 1902, we have been unable to mine in Oklahoma by pick, with the result that coal has been greatly depreciated in value. That has been brought about as the result of our troubles with the miners. When we settled our troubles, that was in the contract with the miners, that we should not mine any more by pick.

Representative Carter. Mining by the pick—what do you mean?

PICK MINING EXPLAINED

Mr. Scholz. It is a process of mining which returns a very large percentage of lump coal, and a very small percentage of slack. In Oklahoma, especially since the development of oil and gas, the market for slack coal has been at a low price. Every bit of slack coal has been sold at $1.50 less than the cost of production, with the result that the lump coal has been caused to bear the loss sustained by the small coal. The only methods we have to offset the work fundamentally done by the miners is the adoption of electric coal mining machinery, which is very expensive, involving a large outlay.

Mr. Snyder. Why do you have to eliminate the use of the pick?

Mr. Scholz. It is a condition which we reluctantly accepted, but we were compelled to. Electric coal mining means the installation of power plants, which are, in themselves, very costly, and the use of mining machines entailing an expense of $2,000 each. Each machine has an output of about 50 tons, which, with the amount of help employed, and the high-class labor, makes quite an expensive process. The cost of an electrically equipped mine is five times as great as it was contemplated to be when the mines were developed. Consequently, to develop these mines to the best interests of the owners, whoever they may be, every encouragement should be held out to the lessees to invest the greatest amount of money required to develop the lands on the best possible basis. If this is not done, and the properties are permitted to run down, when the present leases expire, you will have very little coal available.

I want to bring that feature to your special attention, because your own representatives have called attention to the conditions, realizing fully they could not go on indefinitely, expending money there, without being able to reimburse ourselves.

Mr. Snyder. Have you stated what is your production of coal now?

PRODUCE 1,000,000 TONS

Mr. Scholz. About 1,000,000 tons this year.

Representative Carter. Is that all you can sell?

Mr. Scholz. Yes, sir; the mines in Oklahoma are operated only spasmodically. They operated only 144 days this year out of a possible 250.

Representative Carter. We have all got the reports, but Mr. Campbell wants to know what you think about the valuable coal in the lands.

Mr. Carter. The fact is on our lands—and I have studied them, but have not studied other lands around there, because I have my eyes on nothing except what I have got—I do not place much confidence in that report. I know it is unreliable. You know, Mr. Carter, that the St. Louis and Galveston lease, how the government gives a very elaborate description of the coal that underlies that 1,420 acres, those boys went there and tried it and went broke, and now we have got hold of it the other day in connection with the railroad, about a year ago—that same land—and we took a large steam shovel, much larger than any on the Panama Canal, and larger than anything else ever built of its kind, and we removed the earth, and have gotten down to the coal, and have dug it up. Now, you take the government report of the condition of that coal and compare it with the actual conditions, and there is a wonderful variance. That coal will run twelve inches thick and then drop to five feet.

Representative Carter. There has been a report that that coal was worth some $90,000,000,000.

Mr. Carter. That is all wrong.

AN ERRONEOUS CONCLUSION

Mr. Scholz. I think it is only proper to inform Mr. Campbell as to how the estimate was arrived at. I was one of the witnesses called before the Senate Committee in 1906 to answer that question. It came about this way. One of the Senators had seen a report prepared by Mr. Joseph Taft on the coal deposits in the Indian Territory, which stated that each acre of land was underlaid with 5,000 tons of coal. This same Senator also saw a report prepared by the United States mine inspector of the Indian Territory, Mr. William Cameron, which read that the spot value of the coal was $2 a ton, and so the deduction that the Senator drew from that was 5,000 multiplied by $2 per ton gave $10,000 an acre. He did not take into account the fact that, in the $2, $1.90 represented wages and two cents the profit of the operator.

Mr. Campbell. What is the value of your coal?

Mr. Scholz. I would like to give you the actual cost of our coal to produce. The production of coal in the Hartshorne field ran $1.88 per ton last year. This year it was $1.80. Last year our tonnage was reduced and the price went up. Our Alderson cost $2 a ton. Our Hartshorne coal is inferior coal, compared with the Alderson coal. It is the best domestic coal produced in the United States, in my opinion.

Mr. Campbell. Mr. Scholz, you are a practical man, acquainted with the value of coal lands. What ought the Indians to get for the remainder of the coal they have, per acre?

Mr. Scholz. Mr. Campbell, that is a very difficult question to answer offhand, and one that I believe I am not competent to pass on offhand, but I should say that the price fixed by Mr. Cameron is not far off. The average he fixed is about $38 per acre.

Representative Carter. For coal?

FIGURES TOO HIGH

Mr. Scholz. Yes, sir; I made an appraisal for the Senate Committee in 1906. If I remember correctly, my figures were about $9,000,000. The record will speak for itself. It is Senate Document No. 390, and Mr. Cameron's appraisal was just a little higher than my figures. I think he was $2,000,000 above me, and I venture if Mr. Cameron were here today, and I had the privilege of going over the matter with him, I would bring him to my way of thinking, that his figures are higher than they should be.

Representative Carter. Mr. Cameron was a practical coal man?

Mr. Scholz. Yes, sir.

Representative Carter. And was in charge of mines for years before he became an inspector?

Mr. Scholz. Yes, sir.

Mr. Campbell. When these lands are offered for sale, I take it that some Senators and some Members of Congress and some newspapers and magazine writers and others will proclaim it generally that there is property worth anywhere from four to ninety billions of dollars that somebody probably is going to get at a great deal less than it is worth. You say that it is worth about $38 per acre, and Mr. Cameron says it is worth about $40 an acre?

Mr. Scholz. Somewhere in that neighborhood—between $30 and $40.

Mr. Campbell. You are an operator, and Mr. Cameron was mining inspector for the State of Oklahoma.

Mr. Scholz. For the Untied States Government.

Mr. Campbell. That land has all been appraised, has it not?

Mr. Scholz. Mr. Cameron appraised it and I made an appraisal of it myself. It is on file, and I would be glad to file copies of that.

Mr. Campbell. Your appraisals ran within $2.00?

Mr. Scholz. I am not sure, but I think we were very close together.

Mr. Campbell. What was the basis of your appraisement?

EXPLAINING CALCULATION

Mr. Scholz. The basis which I fixed was the income which had been derived from royalties, and from which I took a part of the income and set aside as a sinking fund, and the other was taken as an interest charge. At that time, the Indian Territory mines produced about 3,000,000 tons of coal a year. At the rate of 8 cents a ton, the annual income was $240,000. I took two cents of that 3,000,000 to be set aside as sinking fund of the property and 6 cents to pay the interest charge, because those two things you cannot get away from. Interest and taxes are sure to follow you, and while I am on the subject of taxes, that is one subject that has not been touched upon, namely, that in our experience in the State of Oklahoma, in charging out of revenue, taxes, we are facing a very dangerous situation, and one which concerns all of us, merely because we do not know what we will have to pay for the mineral rights.

The 5-foot veins will yield 4,000 tons per acre. If all this coal were recovered at the rate of 8 cents per ton, the total royalty will be $320. At the most, only $80 should be charged against the value of the coal, and the remainder to interest. In other words, the value of the coal in the ground at the outside would be 2 cents per ton, and perhaps a great deal less. My experience since leads me to believe that my appraisement was too high, because of the increased tonnage upon which my estimate was based has not been realized. With the increased tonnage upon which my figures were based the owners would lost money, for a period of ten years, or fifteen years, after the property was paid for. They were not able to get enough money to pay interest and set aside a sinking fund. In other words, they were establishing a deficit, and it required up to 1923 before that deficit would be wiped out and from that time and thereafter it would be a money-earning proposition. That was the basis of my appraisal, which I thought a very fair one.

LOSS IN ACREAGE

This, however, does not represent the purchase value of the coal because of the large amount of acreage purchased with a mine which is lost and further reduces the value which a purchaser can afford to pay per acre. The closer coal is located to the place of development, the more valuable it is, hence, coal remote from shaft locations is less valuable because of the length of time elapsing prior to its development.

The coal must also bear the extinguishing charge of the improvements because every ton of coal removed makes the mine that much less valuable. If the original tonnage available in a mine was 2,000,000 tons, and the plant to develop it costs $200,000, it is necessary to set aside one cent as a sinking charge for the equipment, plus the interest thereon. These deductions further diminish the original valuation of the coal.

ELECTRIC FURNACES AT NIAGARA PRODUCE MANUFACTURED GRAPHITE

"The production of natural graphite in the United States in 1915 was approximately 19 per cent, by value, of the graphite imported," says Edson S. Bastin, of the Geological Survey. "In addition to natural graphite, this country produced a considerable amount of manufactured graphite in the electric furnaces at Niagara Falls. The imports came mainly from the island of Ceylon.

"As usual the greater part of the crystalline graphite was produced by New York, Pennsylvania, and Alabama. The production of these States was all of the variety known in the trade as 'flake' graphite that occurs as small flakes forming 5 to 10 per cent, by weight, of crystalline schists, from which it is separated by more or less complicated milling processes. In addition to this a small quantity of crystalline graphite, resembling in a general way the Ceylon graphite, was produced in Montana. As a result of increased production in all of these States but particularly in Alabama the quantity of crystalline graphite produced in 1915 exceeded that for any previous year," declares Mr. Bastin. "The number of producers of crystalline graphite were four in Alabama, one in Montana, three in New York, and two in Pennsylvania," Mr. Bastin finds.

"Amorphous graphite mined in this country is used locally for foundry facings and paint pigments, its production was not stimulated by the war and was considerably below that for 1914. There were three producers located in Nevada, Rhode Island and Wisconsin.

"Graphite in large quantities is manufactured by the Acheson Graphite Co. at Niagara Falls, N. Y., which utilizes electric power generated at the Falls. During 1915 a large new building was erected exclusively for the manufacture of 'Gredag,' a mixture of grease and graphite used for lubricating purposes. In March, 1916 a new furnace house was in process of erection. When this is completed the company will have four furnace houses in Niagara Falls, N. Y., and one in Niagara Falls, Canada, accommodating in all about forty furnaces.

"The demand for graphite electrodes greatly increased during the year on account of the remarkable growth in certain electrochemical industries," Mr. Bastin has ascertained. "The extent of this growth is indicated by the statement made in the *Iron Age* recently that during 1915 the number of electric steel furnaces in operation in this country increased 78 per cent. It is interesting to note that the size of the graphite electrodes made at Niagara Falls ranges from a diameter of 1/16 of an inch to a diameter of 12 inches and a length of 77 inches.

"The bulk graphite produced by this company in 1915 was reported as 2,542 short tons valued at $99,633. This represents only the graphite which would come into competition with natural graphite and does not include certain graphitized products that do not compete with natural graphite."

SUIT OVER COAL LANDS IS WON BY GOVERNMENT

Justice Stafford, of the District of Columbia Supreme Court, has denied the application of Fred W. and Mae Handel, of Montana, for a mandamus to compel Secretary Lane, of the Interior Department, to issue to them a grant for certain coal lands in Montana on the payment of the price of $20 per acre fixed by Congress. The petitioners noted an appeal to the Court of Appeals.

Acting Secretary of the Interior Jones made answer to the petition in the absence of Secretary Lane and pointed out that Congress had fixed merely the minimum price at which the lands might be bought and that the practice of the department has been to have such lands duly appraised and to require payment at the appraised valuation.

In this case, he said, the appraisement ranges from $72 to $80 per acre, and he declared he had no authority to issue a grant of $20 per acre as tendered by the petitioners.

CHAS. A. DAVIS, OF BUREAU OF MINES, DIES SUDDENLY

Prof. Charles A. Davis, a member of the Bureau of Mines, widely known as a geologist and botanist and for his investigations of peat, died April 9 at his residence on Ontario Road, this city, after an illness of several weeks.

Prof. Davis was born at Portsmouth, N. H., September 29, 1861, the son of Louis Gilman and Cyrena Frances (Pierce) Davis. He studied at Bowdoin College from which he received the degree of Bachelor of Arts in 1886, and that of Master of Arts in 1889. He subsequently attended the Cornell School of Forestry for one semester. In 1905 he received the degree of Doctor of Philosophy from the University of Michigan.

Immediately after his graduation from Bowdoin College he became a teacher of science, first at Hyde Park (Illinois) High School, 1886-1896, and then as professor of biology and geology at Alma College, Alma, Mich., 1896-1900. He was an instructor in forestry at the University of Michigan, 1900-1905; curator of the herbarium at the same university, 1905-1908. While acting as a field agent of the Michigan Geological Survey, Prof. Davis, at the suggestion of Dr. Alfred Lane, the State geologist, gave especial attention to the peat deposits of the State, and in 1907, when the technologic branch of the United States Geological Survey began investigations of the origin and use of peat, Prof. Davis became a member of its staff as peat expert. He served in this capacity with the survey from 1907 to 1910, and with the Bureau of Mines, 1910-1912. He was appointed fuel technologist in the Bureau of Mines in 1912, and geologist in 1915.

Prof. Davis was a Fellow of the Geological Society of America and a member of the American Association for the Advancement of Science, Michigan Academy of Science, Washington Academy of Sciences, Washington Geological Society, Washington Botanical Society, Washington Biological Society, Association of American Geographers, National Geographic Society, Alpha Delta Phi (Bowdoin and Michigan chapters), Phi Beta Kappa, Cosmos Club, corresponding member New England Botanical Club.

The published works of Professor Davis include: Peat in Michigan, 1907; The uses of Peat for Fuel and Other Purposes (a bulletin of the Bureau of Mines), 1911, and numerous papers in reports, bulletins and scientific and technical journals.

He was editor of the journal of the American Peat Society from 1907.

As an investigator, Prof. Davis was respected among men of science for breadth of knowledge, keenness of observation, sound judgment, and great technical skill He was recognized as the foremost American authority on peat, and gave his time unsparingly to aiding the development of the peat resources of this country. In studying the utilization of peat he made himself familiar with the methods used in foreign countries in digging and drying peat, in using it for fuel under steam boilers or in gas producers, or for other purposes.

As fuel technologist and as geologist of the Bureau of Mines, Prof. Davis not only gave attention to practical questions of utilization, but studied the origin of peat, lignite and coal, and had begun an investigation of the origin of the oil shales of Colorado and Utah.

The purpose of this work was to determine the nature of the organic remains that yield petroleum when the shales are distilled, and thus to contribute to the utilization of these shales, which are of great prospective importance as sources of gasoline, lubricating oils, mineral waxes and ammonia compounds. In his microscopic studies of these shales and of peat and lignite, Prof. Davis developed original methods of cutting and preparing thin sections for microscopic study, and the high excellence of his skill in preparing and examining these sections is recognized by men of science in this country and abroad.

Prof. Davis endeared himself to his friends and scientific associates by his quiet, modest, and unassuming demeanor and his charity toward those who differed from him. He was loved as well as respected.

He is survived by his wife, Mrs. Frances M. H. Davis, of this city; his mother, Mrs. L. G. Davis, of Portsmouth, N. H.; his sisters, Mrs. Robert Sugden, of Portsmouth, N. H., and Mrs. Arthur W. F. Brown, of Fitchburg, Mass., and his brother, Mr. Percy Davis, of Waltham, Mass.

Interment was made at Portsmouth, N. H.

Canada Leads in Nickel Production

The world's supply of nickel ores in 1912, as estimated by the Metallgesellschaft of Frankfort on the Main, was 28,500 metric tons, of which 20,300 were produced in Canada and shipped in the form of matte to be refined in the United States and England. Germany refined about 5,000 tons, of which a part was probably produced in that country and a part was imported. France refined 2,100 tons of nickel which was imported from New Caledonia. Other countries produced about 1,200 tons, probably, mostly from Norway.

Print New Bulletin

The E. I. du Pont de Nemours & Company of Wilmington, Del., have just had printed a Clay Blasting Booklet. As it is the first booklet ever issued on this subject it contains valuable and interesting information. Some of the phases covered are "Digging Clay," Stripping," "Blasing Down Shale," "Digging Plastic Clays," "Mining Flint Clays," "Draining Clay Pits," as well as full information on the use of explosives.

GOVERNMENT EXPERTS WELL KNOWN TO MINING MEN

H. G. FERGUSON
Geologist

H. G. Ferguson, a geologist of the United States Geological Survey, who has a wide acquaintanceship among mining men, was born in San Rafael, Cal. He began his education in the public schools in Hartford, Conn. Later he graduated from St. Paul's School at Concord, N. H., after which he attended Harvard. He was graduated in 1904 and took a Master of Arts degree in post-graduate work in 1906. In addition Mr. Ferguson spent the winter of 1911 at Yale.

The first work done by Mr. Ferguson after leaving school was in 1906 and 1907 with the Cleveland Cliffs Iron Company, Ishpeming, Mich. In 1907 he was appointed to a vacancy in the Philippine Bureau of Science. He served as geologist with this bureau until 1910. In this latter year Mr. Ferguson was sent as a delegate of the Philippine Government to the International Geological Congress at Stockholm, Sweden. On returning to the United States in 1911 Mr. Ferguson began work with the United States Geological Survey, and has continued with it since.

Various reports on Philippine geology and gold mining in northern California have come from Mr. Ferguson's pen and he has a number of other works in process of printing or of preparation.

FEDERAL TRADE COMMISSION REGARDS UNIFORM ACCOUNTING PLAN WITH FAVOR, IT SEEMS

Active work is being done by the American Mining Congress Committee on Uniform Reports to Government Authorities.

The congress has had a committee working upon this subject for some little time, and this has led to the uniform system of accounting. An accurate system of cost accounting would prevent much of the price-cutting, which, for instance, is so prevalent in the bituminous coal industry.

A recent conference of the committee with the Federal Trade Commission, brought out a statement from one member of the commission, that full 90 per cent of the manufacturing concerns of this country have no knowledge of the exact cost of their production.

This is particularly true of the coal industry. Any system which would lead to a better system of cost accounting would be of service, not only to the companies which do not have such a system, but to other companies, because of the stabilization of prices on the part of competitors who, if they knew it would not sell their production at less than it cost.

The Federal Trade Commission seems willing to give its approval and assistance in securing general approval of such a plan.

E. T. Brent advises Chairman S. A. Taylor, of the Committee on Uniform Accounting of the American Mining Congress, that the Franklin County (Illinois) operators have gone into the matter of a standard system of accounting in a painstaking manner. They have called in expert advice. Mr. Bent regards it as probable that the Franklin County operators will endorse the plan unanimously.

Cerium Has Various Uses

Cerium has been used to a small extent in the coloring of glass, to which certain salts are said to give a yellowish tint; as nitrate in the making of gas mantels, according to Sydney J. Johnstone, The Rare Earth Industry, London, Crosby, Lockwood & Son, 1915, pages 32 and 33; as cerous chloride, in dyeing, for weighting silks, as a mordant, in leather dyeing, a base for dye stuffs of the alizarin group, as catalysts in the manufacture of sulphuric acid, and as a sulphate in an electric accumulator. Thomas A. Edison has taken out a patent for the use of a cerium compound, probably oxide, in a storage battery (No. 1,167,485, January 11, 1916). These are the only uses, aside from that in pyrophoric alloys, of which the U. S. Geological Survey knows.

GOVERNMENT HAS VAST AMOUNT OF DATA ON TAP

An example of the painstaking care exerted by the government to see that all possible information is furnished to those who inquire is shown in a letter received recently by the Bureau of Education from a school teacher in a small town in Minnesota. The letter read as follows:

"Will you kindly send us material on the following subjects: Preparedness, Americanization of Immigrants, Water-power one of the Natural Resources, Peace, Evils of Child Labor, the Seven Wonders of the World Today (Wireless Telegraphy, Telephone, Radium, X-Ray, Spectum Analysis, Aeroplane, Panama Canal)?"

It was necessary to refer this letter to the Geological Survey, Bureau of Mines, Department of Labor, Bureau of Standards, War Department, Smithsonian Institution and Panama Canal office.

Despite the sweeping nature of the request, the school teacher who made it will receive very comprehensive information as to each of the matters concerning which she inquired. The director of the Geological Survey, for instance, replied as follows:

"I am sending you, under separate cover, a copy of Water Supply Paper 234, containing papers on the conservation of water resources, and 400-A, 'The people's interest in water-power resources.' There is also sent you Bulletin 599, 'Our mineral reserve—how to make America industrially independent,' and a chapter from Mineral Resources of the United States for 1912, which contains an article on radium."

Mining men generally have little conception of the amount of aid which the Government can extend to them in their individual work. That the MINING CONGRESS JOURNAL has been very influential in calling attention to this very fact is indicated by the correspondence mentioning the JOURNAL being received by the Bureau of Mines and Geological Survey—the two bureaus whose 1,500 employes are engaged for the most part in work looking to the advancement of the mining industry.

Those who take advantage of the aids offered by the Government often enjoy considerable advantages over mining men who have not come to use this facility. Hundreds of letters are written by the Survey every month acquainting inquirers as to who buy and who sell certain mineral products. A long list of producers, as well as the buyers, are kept on file at the Survey and are furnished on application.

Every effort is made to reach inquirers, even if they are careless and forget to sign their names to the inquiry, or send samples for examination improperly packed. For instance an unsigned letter was received last month written on the stationery of a New Orleans hotel. All information was furnished and forwarded to the proprietor of the hotel along with the original letter in the hope that he would be able to locate the writer. It is rather a common occurrence for tags to reach the Survey without the package of ore samples which undoubtedly accompanied them originally. This usually is due to carelessness in wrapping or attaching the tags or in using tags of flimsy paper.

That some persons have no hesitancy about using the Geological Survey is shown by a recent consignment of twenty-one samples from a Nevada mining man, who asks for the identification of the various samples he sent. The result of this particular examination is as follows:

1. Calcite-lime carbonate. 2. Limonite and calcite. 3. Galena in quartz, 4. Barite-barium sulphate. 5. Iron oxides with some MnO_2. 6. Malachite, iron oxides, quartz. 7. Barite. 8. Iron oxides. 9. Altered igneous rock, possibly diabase or diorite. 10. Calcite and limestone, stained with MnO_2. 11. Quartz with iron oxide and MnO_2. 12. Calcite (aragonite?). 13. None so numbered. 14. Quartz with copper stains. 15. Vein material and altered rock with very little galena. 16. Two specimens. Calcite veinlets in an iron-stained altered rock. 17. Quartz with a little galena. 18. Apparently a quartzite. 19. Jarosite-hydrous potassium iron sulphate. 20. Rock-stained with copper and iron. 21. Highly silicified rock stained with iron and a very little copper.

LEAD ORE OF VERY LOW GRADE IS BEING HANDLED AT A PROFIT

The percentage of lead required to make lead ore have a commercial value varies with several conditions, as for instance, the character of ores occurring in the general district, and the distance from transportation and markets, the U. S. Geological Survey points out. In the western States, where silverlead ore is smelted, lead is desired as a "carrier" for the silver, and ore containing 10 per cent of lead, or occasionally less, is salable.

With a small smelter, distant from a market, lead ore carrying no other valuable metals probably would be required to contain 20 per cent or so of lead to be salable. However, crude lead ores containing as low as 2 or 3 per cent of lead are concentrated or cleaned by milling or hand-picking until by elimination of dirt and gangue the concentrates may contain as high as 80 per cent of lead. Such concentrates would at present have a value in the Joplin district of about $100 per ton, according to C. E. Seibenthal, the Geological Survey's specialist in lead.

INSIDIOUS UNSEEN WASTES OF PETROLEUM MUST BE STOPPED, SAYS MANNING

Resources of the United States Will Be Depleted Prematurely Unless Determined Steps Are Taken Quickly, Contends Director of Bureau of Mines in Written Statement—Only Fifty Per Cent of Oil Recovered

In the course of its investigations conducted for the increase of efficiency in the mineral industries, the Bureau of Mines has given especial attention to the prevention of wastes in the production and utilization of petroleum, writes Van H. Manning, Director of the Bureau of Mines, in explaining the scope of the bureau's petroleum work. It has long been realized by the most intelligent and far-sighted producers that the insidious unseen wastes are far more serious than the visible wastes and that preventive measures must be taken if our petroleum resources are not to be depleted prematurely.

The losses or wastes, incident to the petroleum industry may be broadly divided into two classes, as follows: (1) Losses incident to production, and (2) losses through inefficient utilization.

Among the noteworthy wastes falling within the first class may be mentioned the unrecoverable oil, estimated to be more than 50 per cent of the oil in the land. In addition, there are the invisible wastes due to inefficient protection of oil and gas bearing strata against infiltrating waters.

LOSS IN UTILIZATION

Losses in utilization include not only the actual waste in the use of petroleum and its products, but the making of excessive amounts of less desirable products in manufacturing the products that are in most demand. For instance, gasoline is obtained chiefly from petroleum containing a large proportion of paraffin hydrocarbons, but many of these petroleums yield only small percentages of gasoline under the old distillation methods, so that their utilization in this way has been uneconomical and wasteful. By "cracking" processes the yield of gasoline has been largely increased, but the yield should be still larger. It is estimated that the output of gasoline by the Burton process, the cracking process used by Standard Oil companies, amounted in 1915 to 3,000,000 barrels, but this was equivalent to 18,000,000 barrels of Mid-Continent crude oil; in other words, only about one-sixth of the bulk of an average paraffin-base petroleum from the Mid-Continent field was converted into gasoline by the cracking process most in commercial use in 1915.

Some striking facts regarding present conditions in the petroleum industry, with especial reference to the increased consumption and existing high price of gasoline, are given in a report made by the Secretary of the Interior to the United States Senate under date of February 2, 1916, and published as Senate Document 310.

GASOLINE PRODUCTION

The estimated production of gasoline in the United States in 1915 was 41,600,000 barrels and the amount exported in that year was 6,500,000 barrels, leaving a difference of 35,100,000 barrels for consumption in this country. These figures compare with a production of 12,900,000 barrels, exports of 1,640,000 barrels and an available difference of 11,260,000 barrels in 1909, and a production of 6,920,000 barrels, exports of 594,000 barrels and an available difference of 6,326,000 barrels in 1904.

In regard to the consumption of gasoline, the Secretary of the Interior says:

"The new uses of gasoline and kerosene (coal oil) are of comparative minor importance. The consumption of gasoline has been due to the tremendous growth of old uses.

"The principal uses of gasoline today are as follows:

"(a) Automobiles, motorboats, motorcycles, and aircraft.

"(*b*) Stationary internal-combustion engines.

"(*c*) Traction and other portable units.

"(*d*) General industrial and household uses.

"None of these has yet reached a stage where the future can be accurately forecasted."

The Secretary states that the recent extraordinary rise in the price of gasoline is due to the following causes. The increased consumption of gasoline within the United States, which is estimated to have been 25 per cent greater in 1915 than in 1914; the increase in exports; the depletion of gasoline stocks due to increased domestic and exports demands; the decreased production of crude oil containing a large percentage of gasoline; the increase in the price of crude oil; and financial influences.

DEPOSITS LIMITED

A fact, frequently forgotten, is that, in spite of the enormous production of petroleum in this country, approximately 65 per cent of the world's output, our petroleum deposits are of limited extent as compared with our deposits of coal. The restricted area of prospective oil lands limits the possible number of new fields, and makes imperative both the best use of our present known supply and the curtailing of unnecessary extravagance and of waste in the use of petroleum products. The use of oil as a fuel, when less economically valuable but equally available fuels, such as coal, are at hand, can not be too strongly condemned. We are constantly acquiring knowledge of the nature of the constituents of petroleum and of the possibility of converting these constituents into much wanted and valuable products adapted to higher forms of industrial use.

In conjunction with its efforts toward minimizing of wastes such as are described above, the Bureau of Mines has established at Pittsburgh, Pa., a laboratory that is investigating problems relating to the economical and efficient utilization of petroleum and the conversion of heavier and less desirable oils into lighter and more valuable products. This is the highest type of conservation, and conspicuous success has already been attained in the early investigations, the results of which are being given to the public in a Bureau of Mines bulletin. For the future, there is even greater promise of valuable additions to our knowledge in this field, to be obtained through work in the laboratory and, on a larger scale, through the cooperation and support of the producers and consumers of petroleum products.

This forthcoming bulletin deals with the cracking of petroleum and other hydro-carbons and the production thereby of gasoline, benzene, and toluene. The authors give a comprehensive review of the literature and present in much detail the results of the experiments made by Dr. W. F. Rittman, now chemical engineer of the Bureau of Mines, in the development of improved processes for manufacturing gasoline and benzene-toluene, and present some of the results achieved in working out the benzene-toluene process on a commercial scale.

Applications for patents on both processes have been filed with the intent of having the processes dedicated to the public and the patents assigned to the Secretary of the Interior as trustee for the people of the United States. On February 1, 1916, seven refineries, in six States, were installing plants for the gasoline process. Benzene and toluene were being produced in large quantities by the other process.

OKLAHOMA COAL OPERATORS RELEASED FROM PERMISSIBLE EXPLOSIVES REGULATION

Representatives of the Oklahoma Coal Operators have pledged themselves to make every effort looking to the early adoption of the use of permissible explosives in Oklahoma coal mines.

The matter was discussed very fully at a conference April 13, between the Secretary of the Interior, representatives of the Bureau of Mines, the Bureau of Indian Affairs and the Oklahoma Coal Operators.

As a result of this conference a complete understanding was reached between the operators and the department.

The committee representing the Oklahoma operators consisted of Messrs. P. R. Allen, vice-president, District 21, Southwestern Coal Operators Association; Frank Drew, secretary; James McConnell, James H. Hibben, Dorset Carter, and Carl Scholz, president of the American Mining Congress.

Many Freak Letters Received

Here are some samples of amusing letters which reach the Bureau of Mines:

"Will you be kind enough to send to my good friend —— ——, a bulletin on how to get from a nickle's worth of gas as much as you pay for a quarter? I presume you have a bulletin of this character."

"In reply to your letter I wish to ask you to send me on one of your papers called No. 99 of the war in Europe on the ceramic industries of the United States in which I am sending you the 5 cents for it."

"If you have a sufficient supply of your recent pamphlet, entitled "Hazards in Handling Gasoline," I would be pleased to have half a dozen copies which I could keep for occasional distribution to parties whom I know are using that fluid in a dangerous way. I desire one just at the present time for a doctor's family, who by all the laws of physics and chemistry should have been blown up or burned up some time ago I think the pamphlet is a very excellent one and it should be useful, for apparently Divine Providence hasn't sufficient time to look after all the fools in the world."—From a consulting engineer.

Florida Has Big Springs

No State in the Union has larger or more numerous springs than Florida. Many of them form good-sized streams from the start and some of them are navigable. The largest spring in the State, and one of the largest and probably the best-known in the United States, is Silver Spring, which is located six miles east of Ocala. This spring forms the source of the Oklawaha River, a tributary of the St. Johns, and steamboats traversing the river enter the spring basin, which has an area of several acres. The water is from 25 to 30 feet deep and is wonderfully clear, appearing absolutely colorless.

COAL MINING WILL CONTINUE TO BE ACTIVE INDUSTRY IN HOUTZDALE AREA

Widely Held Idea that Famous Clearfield District of Pennsylvania Has Been Worked Out is Erroneous—Little Left in Old Moshannon Bed, But Lower Deposits as Well as the Capseam Are Being Worked

A general impression has been created that coal mining in the Houtzdale area of Pennsylvania has dwindled to an insignificant industry. Recent observations on the part of George H. Ashley, of the United States Geological Survey, prove that such a conclusion is erroneous.

The Houtzdale area contains more faults than any other of the eastern coal fields north of Birmingham, Alabama. While faulting is a very common occurrence in the western fields of the United States, it is not the rule in Pennsylvania. The geology of the Houtzdale area is difficult to work out, owing to the fact that the rocks are not well exposed. A large amount of work along this line has been done by the Geological Survey and the geological formation of the region in now almost entirely mapped. It will be necessary, however, for some additional field work to be done in this region in order that fossils may be found to check horizons.

The Houtzdale area contains the center of the great Clearfield coal district, and is, as well, the center of the greatest flint-clay district in the United States. While it is true that coal mining has seen its best days in this district, yet there is certain to be considerable mining done for an indefinite period. The Moshannon coal bed, which varied from four and one-half to nine feet in width, yielded a great tonnage of coal in the 70's. The original bed has been almost worked out. At a depth of 150 feet lower than this bed another deposit of coal exists, which is being worked actively. Another bed exists 90 feet lower. Mining conditions, of course, in these lower beds are not so good, and in addition they are split up more than was the coal in the Moshannon bed

Work is being done on the Capseam bed as well and it is the opinion of Mr Ashley that it will be possible to take out all this coal.

During past years there have been a large number of small coal operations in this area, but changing conditions and the increasing scarcity of easily-mined supplies is rapidly ending this sort of work

The clay from this district is of as high grade as any flint clay in the world Fire bricks made from this clay are not only shipped to all parts of the United States but a considerable quantity is exported The soft clay of the region is also valuable; in fact, it is worth almost as much as coal Flint clay is worth, on the average, four times the price of coal at the mouth of the mines.

OCEAN FREIGHT RATES ON GRAPHITE INCREASE MANY TIMES

Only small amounts of the poorer grades of Ceylon graphite were imported during 1915, the extraordinary demand for the higher grades and the shortage of bottoms crowding out the cheaper grades, an investigation by Edson C. Bastin, of the Geological Survey discloses. The present high prices are a result of the increased demands the increased freight rates, war surcharges and higher rates of insurance At the close of 1915 the freight rates from Ceylon were approximately three times what they were before the outbreak of the war and early in March 1916 they had increased about five and one-half times the antebellum rate A part of the increase in 1916 is due to the fact that all Ceylon graphite now comes around the Cape of Good Hope instead of via Suez Canal to avoid danger of capture in the Mediterranean

"The graphite mining industry in Ceylon was in a very depressed condition during 1914 due to labor shortage and the unusually heavy rains that interfered with mining operations," Dr. Bastin has learned. This depression was aggrevated by the embargo imposed in October, 1914, on the exportation of graphite to countries other than the Allies With the modification of the restrictions on exports to the United States early in 1915 and the greatly increased demands for graphite for crucibles to be used in the manufacture of munitions of war, most of the mines resumed operation

"The exports of graphite from Ceylon to the United States in 1915 considerably exceeded those in 1914 and the loss of the German and Belgian trade was partially compensated by increased exports to the United Kingdom and by large exports to Russia which hitherto had consumed very little Ceylon graphite," Dr Bastin points out

---

Geologists Working in Oklahoma

A party of the Associated Geological Engineers from New York, consisting of Messrs. Myron L. Fuller, Frank A Herald, and Ralph W Richards, is conducting geological investigations in northern Oklahoma and southern Kansas.

MANY NOTED MEN HELPED RITTMAN IN HIS WORK

Many minds contributed to the success of the Rittman experiments in developing new oil-refining processes, as is indicated by the following acknowledgments:

Particular thanks are due to Hon. Franklin K. Lane, Secretary of the Interior, for the great interest that he has at all times manifested in the development of the gasoline and benzene-toluene professes and for the hearty support that he has accorded the department employees who have been connected with the work.

Like measure of thanks is due to Mr. Van H. Manning, Director of the Bureau of Mines, for his sympathetic support and hearty cooperation. Without his confidence in the future of the processes they would still be in the laboratory stage of development and their possibilities in large-scale operations would still remain a matter of conjecture and theory.

President Nicholas Murray Butler, of Columbia University, by his kindness in extending the full use of the facilities of the university for the experiments, and by extending all possible privileges and courtesies, greatly facilitated the work.

Credit is also due in a large measure to Mr. W. A. Williams, chief of the petroleum division of the Bureau of Mines, for advice and assistance extended. He has kept in personal touch with the development work and has given freely of his time and knowledge in order to make it a success.

Acknowledgments are due to Prof. Milton C. Whitaker, of Columbia University, for practical advice and personal cooperation in the progress and development of the experimental work leading to the discovery of the processes; to Dr. George A. Hulett, of Princeton University, consulting chemist of the Bureau of Mines, for hearty cooperation and support throughout the long course of experimentation; and to Profs. J. R. L. Morgan, F. J. Metzgar, M. T. Bogart, and Hal T. Beans, of Columbia University, for practical suggestions and advice, and valuable time given to informal discussions of the principles involved in the problem. Thanks are also due to Prof. Gellert Alleman, of Swarthmore College, for constructive advice and assistance and material aid in the successful working out of the problem.

The authors desire to make particular acknowledgment of their indebtedness to Mr. A. J. Moxham, president of the Aetna Explosive Co., for his great interest in the development of the benzene-toluene process and for the time and personal attention that he has given to the related problems. The unfailing courtesy and great consideration that he has uniformly extended, in spite of the numerous discouragements and serious difficulties incident to the early stages of the development operations, have made the cooperative work a genuine pleasure. Acknowledgments are also due to Mr. Egbert Moxham, general manager, and to Maj. J. T. Crabbs, division manager of the Aetna Company, for valuable assistance extended in the analysis and solution of operating difficulties and for facilities given in the accumulation of data concerning plant operations.

Especial acknowledgment is also tendered to Mr. Pennock Hart, president, and Mr. E. H. Haslem, general manager, of Mackintosh, Hemphill & Co., of Pittsburgh, Pa., for the aggressive manner in which the perplexing problems incident to the development of an industrial process from the laboratory to a commercially operative scale have been taken up and successfully solved. Too much credit can not be given to them and to Messrs. C. C. Stutz and S. McMillan and other members of their organization for the great personal interest taken and earnest efforts expended.

The authors are peculiarly indebted to Dr. F. L. Slocum for his valuable assistance and advice during the early stages of development work; also to Mr. Darwin S. Wolcott, for aid and advice and for the faith that he has at all times manifested in the success of the processes. The earnest personal efforts of Dr. David T. Day, consulting chemist of the Bureau of Mines, in the difficult initial work at the outset of the factory development are appreciatively acknowledged.

Thanks are also due to members of the working force of the Aetna Chemical Co. plant, both those connected with the mechanical operation of the process and those connected with the laboratory, for the whole-souled enthusiasm with which they have thrown themselves into the work and contributed unsparingly of time and energy for the successful development of the process.

Particular thanks are due to Dr. Gustav Egloff, who is in charge of the Aetna Company's laboratory at the development plant, for valuable services in connection with the industrial development of the benzene-toluene process and for aid in the preparation of this paper.

JOEL F. VAILE, OF DENVER, VICTIM OF HEART DISEASE

Joel F. Vaile, of Denver, Colorado, died of heart trouble at Pasadena, California, April 3, 1916, at the age of 68 years. Mr. Vaile for thirty years had been connected with the legal department of the Denver and Rio Grande Railway and was its general counsel at the time of his death. As a mining lawyer Mr. Vaile came into prominence because of his connection with the "Last Chance" litigation. Mr. Vaile, by his great learning, his affability, his toleration and his uniform courtesy, endeared himself to all who came in close contact wth him.

The American Mining Congress will miss him from its membership and its secretary will miss the kindly advice and cooperation always so freely given.

GOVERNMENT EXPERTS WELL KNOWN TO MINING MEN

B. S. BUTLER

Geologist

B. S Butler, who is in charge of the copper work being done by the Geological Survey, was born in Gainesville, N. Y He attended the common schools at that place and was graduated from the high school at Nunda, N. Y. He attended normal school at Geneseo Following his normal school course for two years he was principal of the schools at Portageville, N. Y His university education was obtained at Cornell, where he also served for two years as instructor in geology and physical geography.

Mr Butler began work in the Geological Survey in 1907 during which time his principal work has been confined to California, Utah and Alaska He made a detailed investigation of the copper resources of Shasta County, Cal and studied and wrote a report on the San Francisco and adjoining districts of Utah He also made an investigation of potash deposits at Marysvale, Utah and more recently has made a general study of the mining camps of Utah.

SMOKELESS COMBUSTION OF COAL BULLETIN IS MOST POPULAR

The Bureau of Mines "best seller" is Bulletin 40, dealing with the smokeless combustion of coal. More copies of this publication have been sold than any other which has been issued by the Bureau of Mines

In a way, the Bureau officials consider that the number of documents sold for cash is an acid test which indicates the real interest of the country in the publication.

When a bulletin is ready for distribution the Bureau advertises the fact as widely as possible by means of notices in the press and by sending out postcards to selected lists of names. In addition copies of bulletins are mailed without request to those most certain to be interested.

The demand for a bulletin is carefully estimated, and a large number of copies are set aside for free distribution. When this supply becomes exhausted, it is necessary for those desiring copies of the bulletin to secure them from the Superintendent of Documents, when a charge, covering the actual cost of publication, is made.

Next to Bulletin 40 in popularity, as indicated by the number sold, is Bulletin 22 This bulletin treats of analysis of coal throughout the United States. Other bulletins which are particularly popular are mentioned as follows, in the order of their popularity

Bulletin 8, dealing with the flow of heat through furnace walls

Bulletin 21, dealing with the significance of drafts in steam boiler plants.

Bulletin 39, dealing with the smoke problem at boiler plants.

Bulletin 41, dealing with the Government coal purchases under specifications This bulletin urges that coal purchases be made with regard to the heating value of the coal as expressed in thermal units.

Bulletin 63, dealing with sampling coal deliveries

Bulletin 67, dealing with the use of the electric furnace in iron and steel making. This bulletin has been particularly popular and ranks thus low on the list due to the fact that it has not been available for distribution as long as have those mentioned above

Bulletin 57, dealing with safety and efficiency in mine tunnelling.

Bulletin 70, dealing with the Bureau's investigations of radium

Bulletin 77, dealing with the use of the electric furnace in metallurgical plants.

The most popular technical paper, perhaps, which has been issued by the Bureau of Mines is number 80, which deals with the hand firing of soft coal under power plant boilers.

WESTERN LIGNITES OFFER PROMISING FUEL SUPPLY

To one thoroughly familiar with the great extent of the Western lignite deposits, their limited development, and the comparatively simple methods that have thus far been adopted in their utilization as fuel, any investigations looking to a possible and increased utilization of these vast deposits must at once be considered of great economic importance. There is no doubt that much can be done toward improving the methods of burning now in use, and in providing means for using the coal in other forms, such as in a pulverized state, or in the manufacture of producer gas, or of by-product gas, or as residue briquets, according to E. J. Babcock of the Bureau's staff. Especial attention has been given by Mr. Babcock to the study of utilizing the lignite in the form of residue briquets and in the manufacture of by-product gas, because in this method there appear excellent possibilities of providing a satisfactory and efficient fuel and of recovering numerous by-products.

From the results obtained by the methods being developed at the school of mines and the substation of the University of North Dakota there seems little doubt that the briquetting and the production of gas from ligite can in the near future be put on a commercially satisfactory basis.

Because of the ease with which the gas is produced, the low price of the original lignite, the value of the residue, and the low price for which it could be sold if manufactured in a plant used to produce briquets from the residue, the lignite gas should have a large commercial utilization for heating, lighting, and power purposes. It has been found that briquets made from this concentrated residue produce a most excellent fuel, for all practical purposes approaching the efficiency of anthracite. One ton of the air-dried lignite will produce from a half to two-thirds of a ton of briquets in addition to 8,000 or 10,000 cubic feet of gas. The briquets have about twelve-thirteenth the actual heating value of hard coal, and they can be shipped for considerable distances and still prove profitable. The briquets present many advantages, especially over the original lignite as usually placed on the market. The heating value is nearly doubled, the briquets do not disintegrate on standing or burning, they can be stored without being affected by atmospheric conditions, they are uniform in size and are convenient to handle.

COST CALCULATIONS

No detailed statements of the cost of operating a large commercial plant are given in this report for the reason that the cost per ton of briquets and per 1,000 feet of gas and other by-products will depend upon a large number of factors, any one of which may materially affect the cost. For example, the cost of production is much less in a large plant than in a small one, and also less in a plant favorably situated—that is, near a mine, a city, and railway facilities. The use of mine slack, the percentage of moisture in a given lignite deposit, and the relative cheapness of mining and ease of delivery to the plant are all variable conditions and would have to be determined for each individual plant.

In addition the plant could be operated under many modifications of the general process that has been explained; for example, all or a part of the gas might be sold for heating or lighting purposes or converted into electricity. The extraction and production of gas might be carried further in one plant than in another, or the by-products, such as tar and ammonia, could be recovered and marketed, used in part, or entirely neglected. Differences in any of these conditions would materially modify the cost of production.

In general the larger the plant and the more complete the saving of by-products the smaller will be the cost of production. It is believed that in a carefully constructed and operated plant the saving and utilization of the various by-products will so reduce the cost of operation as to make the industry commercially practical and profitable.

All of the data obtained from the investigations and the operation of the experimental plant indicate that a plant of fair capacity, if so constructed as to economize in the original cost, as well as in the cost of operation, and if operated efficiently and under careful management, should turn out excellent commercial products at a cost that would admit of a fair profit.

In order to establish the industry successfully great care should be taken in planning and operating the plant, and the methods employed should follow very closely those that have proved satisfactory in the experimental work, the principles of which are outlined in Mr. Babcock's report, which just has been published by the Bureau of Mines.

Although the general principles involved in the process explained in this report are not complicated, the proper observance of the many details of operation is essential to success, and those managing and operating the plant should have had technical training and experience.

The development of methods for the utilization of low-grade coal will prove of much value to those communities nearest the great lignite deposits in the West. In some of these the lignite could be converted into electricity, which in turn could be sent to surrounding towns and villages, thus distributing power and light from numerous central power plants. Such an arrangement would not only be a great saving of our fuel resources but would also result in the establishment of many industries that can be developed by abundant and cheap electric power.

EXTENT OF DEPOSITS

The existence of vast deposits of lignite in the West, Central and Western States is well known, although the extent and importance of the deposits have not been appreciated, nor has there been an adequate economic utilization of the deposits.

The work of the Bureau of Mines, the United States Geological Survey, and the State geological surveys is disclosing an increasingly large area, underlaid with this kind of coal. Among the States having the largest workable deposits may be mentioned North Dakota, Montana, Wyoming, Colorado, and Texas, and in several other Western States lignite occurs in smaller areas. In North Dakota alone it is estimated that the deposits cover approximately 32,000 square miles, many of them being 10 to 15 feet thick and capable of producing in all several hundred billions of tons of lignite.

When one stops to consider what these figures mean as to the immensity of these deposits in the West, it is not strange that people are seeking to ascertain better means for deriving larger benefits from the proper utilization of those great deposits. Consequently, any proposed methods of utilization that are promising are well worthy of careful consideration.

SCOPE OF INVESTIGATIONS

The Bureau of Mines has been investigating more efficient methods of utilizing fuels. In the State of North Dakota there has been begun at the college of mining engineering of the University of North Dakota, at Grand Forks, and at the mining substation, at Hebron, extended work on a variety of new and practical methods of using lignite. In this work special attention has been paid to the production of gas and its utility and economy for heating, lighting, and power purposes and the manufacture of briquets. In addition, many other improvements in methods of burning and utilizing lignite have been attempted. As the Federal Government controls great tracts of land underlain with lignite, it has a direct interest in the utilization of this fuel, and the Bureau of Mines, in its investigations of fuels belonging to or for the use of the Government, has cooperated in the study of lignite.

What has ben accomplished in this experimental work leads to the belief that great improvements can be made in the methods of utilizing lignite and in the manufacture of cheap gas for power and oher purposes, and that the making of high-grade fuel briquets can be put on a commercially satisfactory basis. The result will be that not only will lignite be much more serviceable and much more generally used, but an immense quantity of slack and coal that would otherwise be wasted will be saved.

Furthermore, by the process described in this bulletin, large quantities of gas, especially valuable for power purposes, may be obtained at a low cost, as the work thus far carried on indicates that this gas can be used successfully with an internal-combustion engine for the production of electricity so as greatly to reduce the cost of power production and thus make possible a wide utilization of cheap electricity for industrial purposes.

WESTERN LIGNITES

In order better to understand why these lignite deposits have not been developed more rapidly and to see what changes are needed to increase their value and usefulness, it is necessary at the start to consider certain general characteristics of lignite.

Western lignites, from different localities, though in general similar, differ somewhat in both physical and chemical properties. Not only in different districts, but also in different mines, the composition varies considerably, especially in ash content, a matter of much importance in conection with the utilization of lignites. If the ash content of a lignite to be used in the production of gas is high, the ash content in the residue will be considerably increased through concentration in carbonization, and hence the residue will be less valuable for use in making briquets.

PROSPECTOR APPEALS TO "HEAD U. S. CHEMIST"

The following letter, addressed to "Head U. S. Chemist, Washington, D. C." is reprinted without changes in spelling or punctuation. It indicates that it is not only the educated mining man who relies on the government for aid. The letter referred to is as follows:

"Inclosed find sample of moylidnin.

"With chemicals hand the assay to Hon. Secretary of War tell him to arrainge with the U. S. to buy it, then send your assay to some refinery. Have the superintendent of the refinery to inform Jessay McCoy what he will pay for it in base form. Landed at ———, Mont., in carload quantities; when you find out about it address a letter to McCoy what action the U. S. take. I may be away when the letters arrive.

"P. S. You will find a small part of allumimum in it."

Director Smith, of the Survey, in reply said:

"Your letter of March 25, addressed to the 'Head U. S. Chemist, Washington, D. C.,' has been referred to this Survey for reply.

"The material which you send is too impure to be of value for a molybdenum ore. It may be of interest to you also to know that the U. S. Government does not purchase molybdenum ores, and also that the Survey is prevented by law from making assays or analyses for private persons or corporations, as you will note from the inclosed slip."

MAGNESITE MINING BOOMS AS WAR SENDS PRICE HIGH

Prices for magnesium have reached the point where the manufacture of metallic magnesium has been undertaken recently by at least four concerns, which had not been manufacturing this metal previously. The companies referred to are: Aviation Material Corporation, 99 Cedar Street, New York; General Electric Co., Schenectady, N. Y.; Magnesium Manufacturing Co., Rumford Falls, Me., and the Norton Laboratories, Lockport, N. Y.

Before the war magnesium was worth $1.60 per pound. Since then it has gone as high as $10 per pound, although at the present it is being furnished at about $7 per pound.

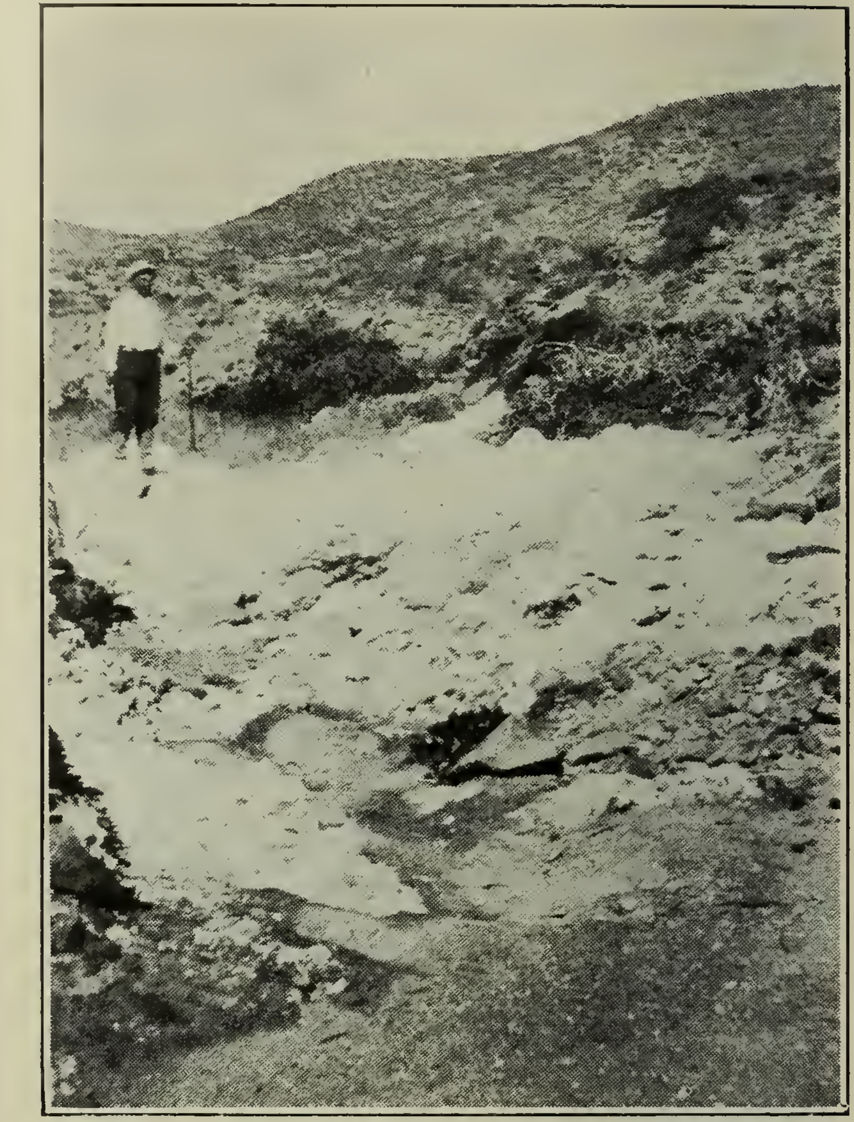
Magnesium, of which there are extensive deposits in the United States, is necessary to the manufacture of shrapnel and illuminating shells. In shrapnel a few ounces of magnesium are placed in order to make visible the point where the shell explodes. In the daytime the magnesium gives out a characteristic white cloud, while at night its blinding flame is visible at long distances.

There is an increasing demand for magnesium in other industries. It has been found that by alloying it with zinc, that a lighter and tougher material than aluminum can be obtained. Just at present there is a great demand for this material for constructing frames for aeroplane engines and for other constructional purposes where weight is a factor.

Queer enough metallic magnesium is not made from magnesite, the carbonate, but from magnesite chloride. Magnesite chloride before the war was obtained almost exclusively from Stassfurt, Germany, where it was obtained as a by-product from potash. The German product was sold here from $6 to $8 per ton. This was much lower than it could be produced in this country from bitterns or by treating magnesite silicate or some other form of magnesite-bearing rocks with hydrochloric acid.

Magnesite also has become very scarce. The brick and steel makers in the United States depended largely upon Austria for their supplies, although some was obtained in Greece before the war, and that country is still furnishing a certain limited supply.

The war, however, has resulted in the most exceptional mining activity in the deposits in California and Nevada. Previous to the war little of the California magnesite was used due to the fact that it did not contain iron oxide which made it practicable for use. It remained for Frank L. Hess, a geologist in the Geological Survey, to point out that the same result could be obtained by mixing iron oxide with the California product.



OUTCROP OF MAGNESITE IN LOWER CALIFORNIA

Another factor which has made possible the use of California magnesite is the fact that there have been very decided reductions in railroad rates as a result of the opening of the Panama Canal. A considerable number of new calcining furnaces have been blown in in California and an increased quantity of magnesite is reaching the eastern market.

One of the most remarkable magnesite deposits in this hemisphere exists on Santa Margarita Island off lower California. This deposit is described as being very extensive. It is being exploited by the International Magnesite Co., of which J. E. Blackman, 665 Wilshire Place, Los Angeles, Cal., is the president.

NEW MOVING PICTURE FILM SHOWS BUREAU'S WORK

At the request of Director Manning of the Bureau of Mines, a new two-reel film, "The Work of the U. S. Bureau of Mines," has been made and is now available for the use of the Bureau. The following subjects are illustrated: Mine rescue training; bureau rescue crew at mine explosion; first aid by bureau-trained miners; testing explosives; sand test to determine the strength of electric detonators; inflammability of coal dust; rock-dust barriers; sampling and analyzing mine air; methane indicator; using canary bird to detect nonrespirable air; testing oil safety lamps; testing electrical equipment; coal sampling; instrument making; determination of the clinkering quality of ash; glass-blower making intricate chemical apparatus; separation of gas mixtures by fractional distillation in a vacuum at low temperatures; radium.

THE
MINING CONGRESS
JOURNAL

PUBLISHED EACH MONTH BY
THE AMERICAN MINING CONGRESS.
Munsey Building. Washington, D. C.

Subscription Rate, per year............. $2 00
Single Copies.......................... .20

Entered as Second Class Matter January 30, 1915, at the Postoffice at Washington, D. C.

MAY, 1916

EDITORIALS

CHANGES IN MR. HAYDEN'S BILL ARE SUGGESTED

The American Mining Congress believes that the enactment of House bill No. 12426 to authorize mining for metalliferous minerals on the Indian reservations in the State of Arizona will be of great benefit in that it will make possible the development of metalliferous mines within the Indian reservations, and thus make valuable this now unknown resource.

Section 8 of the bill provides a royalty of 5 per cent on the gross value of the output of minerals at the mine. We believe this section should be changed as many complex ores carry various metallic values which it is impossible to recover and in most instances there is a great loss in the reduction of metalliferous ores. For instance a complex ore carrying gold, silver, lead, zinc and antimony might easily be penalized upon the zinc and antimony contents to such an extent as to reduce by 50 per cent the actual value recovered from the ore.

The customary form of lease in use throughout the West provides for a graded royalty. The higher grade of ores call for a higher royalty charge Upon the operation of mines more or less developed the customary charge is 10 per cent of the net returns upon milling ores call for a higher royalty charge. that concentration is required to produce a product sufficiently valuable to justify freight and smelter charges) and 15 per cent upon ores of a character to justify direct shipment to the smelter.

To meet this theory the following form is frequently used:

> To pay said lessor as royalty 10 per cent of the net mill or smelter returns upon all milling ores and 15 per cent upon all net mill or smelter returns of all smelting ores

This form might lead to misunderstanding by those who do not understand that low grade ores are required to go through two manufacturing processes before the mineral is ready for the market. Another form which may be better understood is as follows:

> To pay to said lessor as royalty 10 per cent of mill or smelter returns on all ores sold for $10.00 per ton or less net price after deducting freight and milling charges and 15 per cent of the like net mill or smelter returns on all ores sold for more than $10.00 per ton net price as aforesaid

There would seem to be no reason for the requirement in Section 10 that the operator should furnish information concerning the cost of mining, in that it does not matter to the Government how much money is spent in operations so long as the royalties are paid upon the returns of the ore produced.

COOPERATION NEEDED TO STOP CAR SHORTAGE

The recent congestion of freight and the inability of shippers to get their goods to market has called special attention to the need of greater efficiency in the handling of freight by the railroads of the country.

The number of freight cars required to handle the traffic can be greatly diminished. While the rapidity with which cars are handled from one point to another and the time required in loading and unloading has much to do with the efficiency of car service, another element, which is usually lost sight of, will be of marked benefit in reaching a solution of this problem.

Mining products can easily be loaded to the full limit of the cars, which is 10 per cent beyond their rated capacity. An 80,000 capacity car weighs approximately 42,000 pounds, and in most cases where mine equipment is involved the empty car is returned without loading, in which case the tare weight must be considered twice, hence the net compared with the gross is 48.8 per cent. If these cars are loaded 10 per cent beyond the stencilled capacity, which is the permissible limit, the net of the car is at once increased to 51.1 per cent, showing a saving of 2½ per cent without any cost to the shippers. In fact there is a gain because of the reduced number of times in which the cars are shifted under the tipple, which involves a loss of time as well as in the fact that every time the car carries 10 per cent more than it usually holds the selling expense is reduced correspondingly.

Coal operators have frequently suffered much hardship because of their inability to get sufficient cars to handle the traffic. Better service which would result from full loaded cars not only for full shipment but upon return shipment of supplies would enable the railroads to render better service and is a decided step toward efficiency.

HEAVY LOSSES IN MEXICO A WARNING TO CAPITAL

Matters in Mexico, so far as the mining man is concerned, have improved very little despite the fact that a large area of the republic has enjoyed a sort of peace for a number of months. Of course with the existing conditions in Chihuahua, Sonora, Durango, Coahuila and other northern states no mining operations are being carried on. In the central and southern states, however, some companies are operating despite the irregularity of transportation and the instability which characterizes the whole political structure. Great difficulty is being experienced, according to advices reaching Washington, in obtaining explosives. If explosives pass the Federal authorities at the Custom Houses they have to run the gauntlet of the state and municipal officials. Each little chief seems particularly desirous of accumulating whatever explosives may come within his graps. As so much of the mining in Mexico is done in the hardest sort of rock very little progress can be made without dynamite.

Now that Carranza proposes to make drastic changes in the mining laws, a fresh bunch of troubles doubtless is in the offing.

While it always has been the attitude of the American Mining Congress that so long as opportunities for investment in promising properties in the United States are offered, American capital should not be so ready to reach into foreign countries. The tremendous losses that have been visited upon Americans who have invested in Mexican mining properties, doubtless will do much to discourage such investments for many years to come.

The blame, however, is not to be placed upon the American investor. The mining laws of the United States are so archaic that they have forced millions of dollars of American capital into other countries where the mining laws are better suited to the development of the industry. It is the very generally accepted belief that a large percentage of the capital that is now going into foreign countries for investment in mining properties will stay in the United States as soon as the laws have been revised intelligently.

The trouble in Mexico is not with the mining law. The law in that country during the administration of Porfirio Diaz was intelligently interpreted and was very generally satisfactory to the mining industry. Regardless of the widely accepted opinion that the courts were not the most honorable in the world, there was a minimum amount of litigation. It is true that there were several spectacular cases which involved foreign interests before the Mexican courts, to which much publicity was given and in some quarters created a rather erroneous idea as to the amount of litigation in that republic.

While the American Mining Congress is in no way in sympathy with the lax manner in which the State Department is insisting on the rights of the American mining man in Mexico, it is of the opinion that a great deal of the capital that has gone into Mexico would have been invested to a greater advantage in the United States. There are such vast undeveloped mineral resources in this country that are crying out for capital, and which offer such splendid opportunities, that we can but regret seeing such great quantities of money going to the developing of mineral resources in other countries.

PERMANENT GOOD RESULTS ARE FOLLOWING RESEARCH

Conduction of extensive researches into mining and metallurgical problems under present conditions is regarded by scientists in Washington as likely to be one of the most far-reaching benefits of the present war. Under normal conditions profits are not such as to justify anything like the amount of experimentation that is now in progress. Out of all these experiments great permanent good has come and the promise is that much greater benefits will result. Not all of the achievements are positive. There is a great deal of negative information being obtained in the laboratories and by engineers, the importance of which often times is overlooked, but which is of the greatest value to the industry.

There is a great difference of opinion as to the future of the metal market following the declaration of peace. All of the prominent specialists who have any ideas on this subject, however, agree that it is best to subordinate everything else to the idea of getting the hay into the barn while the sun shines. The price of many metals may be sustained after the war, but the chances of a different result are sufficient to cause all to advise the quick marketing of all metals at present prices.

STATISTICAL INQUIRIES SHOULD GET QUICK REPLY

Mineral producers throughout the country are urged to be as prompt as possible in making statistical returns requested by the Geological Survey and the Bureau of Mines. This cooperation on the part of mine operators greatly facilities the compiling of very valuable information to the industry.

Director Smith of the Geological Survey advises us that the delay in getting these replies is greater this year. As we are on the ground and in daily touch with the work being done by the Geological Survey and the Bureau of Mines in the interest of the mining industry we can see the need for the prompt compliance with this request more clearly perhaps than the busy mine operator in some other part of the country.

The Government is doing very remarkable service in the interest of the mining industry. This is especially true when it is considered that Congress supplies it with inadequate funds to undertake work on the scale that really is necessary. Considering the money at their disposal the directors of the Geological Survey and the Bureau of Mines are accomplishing notable results.

LEASING SYSTEM WILL PERPETUATE MONOPOLY

The application of the leasing system will throttle development. It will perpetuate a monopoly in those who have already acquired ownership in mineral resources. It will create a system of landlord and tenant between the Government and its citizens, entirely subversive of the best interests of the nation. The States will be unable to maintain law and order over the whole of a territory more than one-half of which is exempt from the state taxing power, without unjust burdens upon its taxpayers. In order to maintain properly its hospitals and asylums, its courts, its schools and public roads, the State must have the right to tax all the property benefited by these public agencies.

AT PRESENT RATE OF PRODUCTION PETROLEUM WILL LAST 27 YEARS, SAYS RANDALL

Oklahoma Representative Calls on Secretary of Interior for Extensive Information With Regard to Oil Industry and Asks Him if It is Advisable for the Government to Go into the Oil Business

Hearings are in progress before a subcommittee of the House Committee on Mines and Mining, on House Resolution 175, by Mr. Randall, of Oklahoma. Mr. Randall, in explaining his resolution, makes the following statement:

"This resolution is divided into practically two resolutions. One is rather a sequel of what may be developed under the first section. For instance, the resolution first asks the secretary to supply information as to the area and estimated supply of oil-bearing lands now owned by the United States with a discussion of the various grades of oil that can be produced. The further estimated fuel needs of the navy for a term of ten years are asked and the effect upon the navy if such oil lands are permitted to remain in private ownership and in the hands of speculators. Thirdly, the resolution asks the secretary's opinion of the advisability of the establishment by the government, through the Bureau of Mines, of oil pumping plants. It also asks for the secretary's opinion of the production of gasoline by the Rittman process and such other agencies as may be required to utilize the oil reserves in the United States.

"As a sequel to the foregoing portion of the resolution it is provided if the secretary finds, from the situation as to the government's interests, that it would be necessary to go further and acquire the remaining oil lands of the country, then we ask for his recommendation as to that.

INCREASED USE

"I have called attention in the preamble to the great increase in the production of gasoline, which, I believe, is estimated as having risen from 6,680,000 barrels in 1899 to 41,600,000 barrels in 1915."

In the preamble of his resolution Mr. Randall declares that the products of petroleum have become absolute and daily necessities in almost every avenue of industrial enterprise as well as in the social and domestic life of the people. He states that the power generated today by gasoline and other products of petroleum is more than double that produced by all other agencies combined. He estimates the total visible supply of petroleum in the United States today at 7,600,000,000 barrels and that at the present rate of production, 280,000,000 barrels per year, the supply would be exhausted in twenty-seven years. He also contends that exploitation of rich petroleum deposits is being carried on by monopolistic corporations to secure quick and unearned profits, without regard for the conservation of this natural resource.

In this connection, Mr. Randall makes the following statement with regard to the Standard Oil Company:

"The Standard Oil group has distributed since December, 1911, in regular and extra cash dividends a total of $290,666,083, to which must be added stock dividends at par totaling $169,100,000, and taking into account the present market price of distributed stock, the profits of this corporation, reaped from a natural resource placed in the earth for all the people, is in excess of $500,000,000 in the last four years."

CONCLUSION

He draws this conclusion:

"Nearly all waste of petroleum and crude oil can be saved by producing gasoline through the Rittman process, discovered in the Bureau of Mines, and now the property of the United States, which not only increases the yield of gasoline, but utilizes for this purpose crude oil, kerosene or any other low-grade distillates, none of which are now used.

"This process has been placed freely at the disposal and use of private refining companies, including the Standard Oil Company, but was declined because the government insisted on a clause in the contract prohibiting its monopolistic use."

The provisions of the bill are: That the Secretary of the Interior be directed to furnish the House of Representatives information in this department as follows:

First. The area and estimated supply of oil-bearing land owned by the United States, with description of the various grades of oil which can be produced.

Second. An estimate of the fuel needs of the navy for a term of ten years and the effect upon the navy if such oil lands are permitted to remain in private ownership and in the hands of speculators.

Third. The advisability of the establishment by the government, through the Bureau of Mines, of oil-pumping plants, gasoline production by the Rittman process, and such other agencies as may be required, utilizing the oil reserves of the United States.

It also is provided that the Secretary of the

Interior be directed to report to the House of Representatives his opinion as to the advisability of the purchase, by condemnation proceedings, or in any manner whatever, by the United States of the entire oil-producing area of this country, to the end that the United States may protect fuel supplies for its own use in the future and to conserve for all the people a natural resource which is so indispensable as petroleum.

B. F. GOODRICH COMPANY FINDS ADVERTISING BIG ASSET

The growth of the B. F. Goodrich Co., which is the largest rubber factory in the world and produces over 20,000 different articles of rubber, including auto, motorcycle, bicycle, truck and carriage tires, hose, belting, packing, molded goods, raincoats, boots and shoes, water-bottles, and in fact "everything in rubber," is largely attributed to its progressive advertising policies. In fair weather or foul, Goodrich advertising has stood forth as prominently and continuously as Gibraltar.

The Goodrich Company always has been a strong believer in advertising because it has seen its business multiply and prosper under the sun and rain of publicity. In no other way could it have told so many millions of people about the goodness of Goodrich goods, in so short a time, or so economically. The Goodrich factories are at work night and day. Each year the company invests more and more money in advertising and each year is forced to build and build to care for increasing business.

E. C. Tibbits, on April 7 concluded his nineteenth year as the advertising manager of the B. F. Goodrich Co.

USE OF DOUBLE CASING IN ARTESIAN WELLS

In their investigation of the wells and underground waters of Florida the geologists of the United States Geological Survey have noted many interesting things. Among these is a well at Welaka, on St. Johns River, from which two kinds of water are obtained.

This well is 309 feet deep. The length of the casing is 110 feet. The well was first drilled to 160 feet, and from this depth ordinary "sulphur" water was obtained. The drill was then carried to a depth of 309 feet, where it encountered a strong mineral water, having a disagreeable, salty taste. In order to use both kinds of water an inner tubing was run nearly to the bottom of the well. Both this and the outer casing were connected with pumps, so that ordinary water and mineral water can be pumped at the same time. A favorite joke played on visitors is to give them a drink of the weaker water in the first glass and to replace it with the brine in the second.

Not more than half a dozen wells of this kind are known in the country, but there is no reason why similar wells cannot be obtained in regions where the waters in the upper strata differ from those lying deeper.

CHICAGO PAPER IMPRESSED BY DR. HOLMES' WORK

Chicago *Tribune*.

It was about eight years ago that Congress authorized the creation of the Bureau of Mines. Dr. Joseph A. Holmes, who died recently, was the moving spirit in the work of securing the sanction of Congress for the plan to establish a bureau. The study of conditions in the mines of the country and of means to decrease the number of accidents incident to their operation was the life labor of Joseph A. Holmes. His death was due largely to the hard work that he did in order that the lives of others might be saved.

It is gratifying to learn from a report of the Secretary of the Interior, of whose department the Bureau of Mines is a part, that the death rate of each thousand men employed in the mining industry is lower than it has been in sixteen years, and it should be remembered that mining operations have increased largely in extent. Secretary Lane says that as a result of the general safety campaign that has been carried on for several years, accidents in the mines not only are decreasing, but that other mining conditions are improving and that there is possible today "the most gratifying report that the bureau of mines has been able to make since it was established."

The work of Dr. Joseph A. Holmes was not lost. He began a campaign which other men now are carrying on. The United States today mines 40 per cent of the entire coal of the world, as much as Great Britain and Germany combined. It employs an ever-increasing army of men, who need protection in their perilous occupation. It is grateful to be able to say that miners and operators generally give credit to Dr. Holmes for his high and successful endeavor.

Col. W. L. Stevenson, President of the Hargraves Engineering Co., of Skagway Alaska, has been in Washington, New York and other cities on business connected with the company. The company is operating an antimony mine on the Kantishna River, Alaska and has received favorable reports from its engineer in charge.

John A. Rice, a mining engineer of El Paso, who has been in charge of exploratory work in a mining property at Silver Center, near Cobalt, Ontario, was in Washington April 21 and 22. He is en route to take up work in southeastern Utah.

IMPORTANCE OF FLOTATION IN METALLURGY TOO VAST TO ESTIMATE

Development of Last Two Years a Remarkable Chapter in the Mining Industry of United States—Accumulation of Ores Which Could Not be Treated Profitably in Past Now Are Yielding up Precious Contents

The following general statements on flotation are authorized by the Bureau of Mines as a mode of answering a type of general questions the bureau is receiving in great numbers, and also in order to convey a general idea of what flotation is, how it may be of service, and where more detailed information may be obtained. Later, the bureau plans to issue a bulletin on flotation and to describe fully the application of the processes in use.

TYPES OF PROCESSES

Flotation is the process or processes by which the valuable minerals in a mass of finely ground ore can be caused to float on a liquid into which the finely ground ore is fed. The different flotation processes can be classified under two types, *film flotation* and *froth flotation*.

In film flotation the mineral particles that float are sustained on the surface film of the liquid. In froth flotation the minerals floated gather in and on the surfaces of bubbles of air or gas driven into or generated in the liquid in some convenient manner. As the surface of a mass of bubbles overlying a liquid is greater than that of the upper surface of the liquid, a froth will carry a greater burden per square foot of area of liquid than the film surface of the liquid.

Bubbles of gas or air in the pulp may be made in many ways: By beating in air with a device resembling a ship propeller or the impeller of a contrifugal pump (Minerals Separation and other machines); or by turning in compressed air in fine streams (Callow and similar pneumatic cells); or by generating a gas by chemical action of an acid on some constituent of the ore, like calcite or siderite (DeBavey and Delprat processes); or by applying reduced pressure to the surface of a pulp saturated with air and causing the dissolved air to be liberated in bubbles (Elmore process).

For all practical considerations, these processes of froth flotation obtain the same result in much the same manner. In each, bubbles attach themselves to particles of valuable minerals and carry these particles to the surface of the pulp where the resultant froth can be skimmed off or allowed to overflow.

Several specialized types of flotation have received names that are becoming standard. *Selective flotation* is fairly generally understood to refer to the surface or froth "selecting" the valuable minerals rather than the gangue of the ore. Sulphide minerals as well as a few native metals like gold, silver, and copper can thus be selectively floated from a gangue consisting largely of quartz, calcite, feldspar, or other "rocky" minerals. However, some metallurgists have recently adopted the term in another sense, using it instead of the term *differential flotation.* By *differential flotation* is meant the flotation of one flotative mineral in the presence of another ordinarily flotative. For example, the flotation of galena from a pulp containing sphalerite is a true differential flotation. Another type of flotation that has been much talked about is *preferential flotation,* which is a name applied to a special type of differential flotation by Horwood, an Australian metallurgist, who gives a mixture of two flotative sulphide minerals a light roast in order that one may be oxidized while the other remains unchanged. Only the surface film of one of the minerals is oxidized, but this suffices to keep it from floating. Thus, if an ore contains galena and sphalerite, the galena can be superficially oxidized so that it will not float, while the sphalerite, which is more resistant to roasting, can be floated *preferentially* from the mixed pulp.

Oils of various kinds are generally used now in flotation in order to give permanent froths and to make the air bubbles attach to certain minerals only. Animal, vegetable, and mineral oils, including acid sludge, have been used with more or less effect, but those oils that seem to be most widely favored at present are derived from the distillation of wood, or from the resinous products from certain woods. Particular ores or mixtures of minerals seem to require oils having certain properties, and at present it is necessary to find by tests the oil or mixture of oils that will give best results with the ore to be treated.

ORIGIN OF FLOTATION

Although flotation has only recently received the general attention of American metallurgists, it is not by any means a new method of ore concentration. As far back as 1860, it is reported that an Englishman named Haynes patented a process which depended on the fact that if a mixture of the minerals could be wet by certain oils, while the other minerals of the ore would not be wetted by these oils. In 1886 Bradford and Everson both attempted to apply the affinity of oil for wetting various minerals, and since then the effort has been repeated frequently. It was not recognized at first that there is no need of using a large amount of oil to do the floating and that much more buoyancy can be obtained in the floting scum of oil and minerals by blowing in air bubbles to form a froth. "Bulk oil" flotation was thus the first logical development, and this gradually led to frothing flotation methods; then the amount of oil was cut down, and now there are mills that use as little as 0.2 pound of oil per ton of ore, and some that use no oil at all.

APPLICATIONS OF FLOTATION

The great field of flotation has been the prevention of slime losses in ordinary concentrating mills for ores containing valuable sulphides or native metals. In such mills copper, lead, and zinc sulphides, when finely divided as "slimes,' 'have often been completely lost and only the coarser particles of ore recovered. There has been a considerable development of such concentrating devices as slime tables, vanners, bubbles, and other devices for the recovery of these valuable minerals from slimes, but the extractions obtained by these devices have never been wholly satisfactory. For minerals such as those mentioned flotation fills a long-felt want. In fact it is only the fines and slimes that are capable of treatment by this process, as the larger particles of mineral sink, being too heavy to be supported by bubbles or the film surface of a liquid.

Where the valuable minerals of an ore occur as very small grains, so that the ore must be crushed exceedingly fine in order to liberate them, flotation evidently is particularly suitable for removing the fine particles of valuable minerals. Further, when an ore contains a valuable mineral having the same specific gravity as the gangue (for instance, sphalerite in a gangue of barite) it is often possible to float the ore or the gangue and thus obtain a clean separation. Also, the use of differential flotation in separating mixtures of sphalerite and galena, or of sphalerite and pyrite, or of chalcopyrite and pyrite, is proving of immense importance.

More recently it has been found possible to sulphidize carbonate ores of lead and copper by treating them with solutions of soluble sulphides or with sulphur vapor. These artificial sulphides seem to float as well as the natural sulphides. As some of the carbonate minerals have a tendency to slime very badly, this method of recovering them promises to be of much value.

Some gold and silver ores ordinarily treated by cyanidation can be treated more cheaply by flotation than by cyanidation, and with as high a recovery of gold and silver It is also possible to recover in this manner the values in some ores which cannot be successfully treated by cyanidation. Thus for such ores flotation is proving to be either a partial or a complete substitute for cyanidation. It is doubtful whether flotation will ever completely displace the cyanide process, because the latter produces metal for shipment, whereas the flotation process ordinarily produces only high-grade concentrates for sale to the smelters.

IMPORTANCE OF FLOTATION

In the light of the above statements it can be seen that flotation has justly assumed vast importance in metallurgy. The quick turn that American metallurgists took in favor of the process is significant of the developments of the past two years Until then flotation processes had been held in considerable question. At present they are almost universally recognized as the best means of preventing slime losses, and there is a decided tendency toward the application of flotation methods in the retreatment of low-grade and complex ores. Accumulations of ores, which for one reason or another have been too difficult to handle in the past, are now being treated by methods which involve flotation, and at this time it is difficult to predict how far flotation will prove to be a solution of such problems as those above mentioned

SELECTED BIBLIOGRAPHY

For those who wish information on the fundamentals of flotation the following selected bibliography has been prepared.

BOOKS

Hoover, T. J. Concentration of ores by flotation. 2d ed. 1914. — pp.

Rickard. T. A. On flotation. 1916. —pp A compilation of articles published in *The Mining* and *Scientific Press*.

OTHER LITERATURE

Hoover gives in his book a rather long list of references on flotation up to the middle of 1913 The following selected references, largely taken from the literature since that time, review the present status of flotation processes:

GENERAL PRACTICE

Read, T. T. Engles mine and mill: Min and Sci. Press, vol. 111, July 31, 1915, pp. 167-171.

Symons, T. The Timber Butte mill: Am Inst. Min. Eng., Bull 102, June, 1915, p. 1,295.

Callow, J. M. Notes on flotation: Am Inst. Min Eng., Bull. 108, pp. 2321.

Anon Flotation at the Inspiration mine: Min and Sci. Press, vol 111, July 3, 1915, pp. 7-10

Anon. The Hunter mill: Eng and Min Jour., vol. 100, Dec 25, 1915, pp 1044-46

Ralston, O. C Flotation in 1915 Met. and Chem Eng., vol. 14, Jan 1, 1916, pp 2, 3.

Ralston, O C., and Cameron, F. Recent progress in flotation: Eng and Min Jour., vol. 99, May 29, 1915, pp 937-940

Tupper. Flotation progress in 1916: Mining World, vol. 44, 1916, p. 1.

FLOTATION TESTING

Ralston, O. C., and Allen, G. L. Testing ores for flotation process: Min and Sci. Press, vol. 112, Jan. 1, 8, 1915, pp. 8-13, 44-49.

Smith, R. W. Flotation testing machine: Eng. and Min. Jour., vol. 100, Sept. 4, 1915, pp. 395-396.

THEORY OF FLOTATION

Mickle, K. A. The flotation of minerals: Eng. and Min. Jour., vol. 94, July 13, 1912, pp. 71-76.

Rickard, T. A. What is flotation? Min. and Sci. Press, vol. 111, Sept. 11, Oct. 2, 1915, pp. 383-386, 513-517.

Durel, C. T. Why is flotation? Min. and Sci. Press, vol. 111, Sept. 18, 1915, pp. 428-431.

Ralston, O. C. Why do minerals float? Min. an Sci. Press, vol. 111, Oct. 23, 1915 pp. 623-627.

Callow, J. M. Notes on flotation (see also reference under General Practice).

Bains, T. Electrical theory of flotation: Min. and Sci. Press, vol. 111, Nov. 27, Dec. 11, 1915, pp. 824-826, 883-884.

FLOTATION OILS

Anon. Flotation of copper ores: Min. and Sci. Press, vol. 110, May 1, 1915, pp. 680-682.

Coutts, J. Testing oils for flotation: Eng. and Min. Jour., vol. 99, June 19, 1915, pp. 1079-1080.

Mueler, W. A. Coal tar in flotation: Eng. and Min. Jour., vol. 100, Oct. 9, 1915, pp. 591-593.

Sherwood, C. F. Use of pine oil for flotation: Eng. and Min. Jour., vol. 101, Jan. 1, 1916, pp. 21-22.

DIFFERENTIAL FLOTATION

Anon. Bradford selective flotation: Eng. and Min. Jour., vol. 100, Oct. 2, 1915, p. 562.

Ralston, O. C. Preferential flotation: Min. and Sci. Press, vol. 110, June 26, 1915, pp. 980-984.

FILM FLOTATION

Ingalls, W. R. Concentration upside down: Eng. and Min. Jour., vol. 84, 1907, p. 765.

Hofstrand, O. B. The Macquisten tube flotation process: Trans. Am. Inst. Min. Eng., vol. 43, 1912, pp. 692-697.

SPECIAL APPLICATIONS

Anon. Flotation at Cripple Creek: Eng. and Min. Jour., vol. 100, Dec. 11, 1915, pp. 964-965.

Smith, H. H. Flotation of silver-lead mineral at a New South Wales mine: Eng. and Min. Jour., vol. 100, Dec. 11, 1915, pp. 953-957.

GENERAL BIBLIOGRAPHY

Attention is called to a paper entitled "Bibliography, Concentrating Ores by Flotation," compiled by Jesse Cunningham, Librarian of the School of Mines and Metallurgy, University of Missouri, Rolla, Mo., and published as Bull. 1, Vol. 8, University of Missouri, Jan., 1916, 106 pp. This paper includes brief abstracts of important British and United States patents covering flotation processes, and a bibliography of litigation.

The Bureau of Mines and the Missouri State School of Mines are tentatively planning—last mentioned to cooperate in keeping this "General Bibliography" up to date—issue of supplements and revised re-editions when necessary.

BUREAU OF MINES URGES USE OF STRONGER DETONATORS

The Bureau of Mines, Department of Interior, Washington, D. C., in its bulletins and technical papers bearing on the use of explosives, reccommends the use of nothing weaker than No. 6 detonators (blasting caps and electric caps), which recommendation together with reports from the various powder companies regarding unsatisfactory results obtained by users of explosives when detonators weaker than No. 6 are used, led the Institute of Manufacturers of Explosives (which is composed of practically all the powder manufacturers in the East) to ask manufacturers of detonators to make nothing weaker than No. 6. The Du Pont Company in a communication to the MINING CONGRESS JOURNAL advises that it has promised to do this and as soon as the present stock of detonators weaker than No. 6 is exhausted, their sale will be discontinued.

Practically all high explosives manufactured today are of the relatively less sensitive type (and consequently safer), but as it is therefore necessary to use a powerful detonator (not weaker than No. 6) to ensure complete detonation, it should be self-evident that weak detonators reduce the blasting efficiency of the explosives and increase blasting costs.

The United States Government recommends stronger detonators; the Institute of Manufacturers of Explosives recommends stronger detonators; the powder manufacturers recommend stronger detonators.

WOLFLIN SUCCEEDS PAUL AS HEAD OF RESCUE WORK

Hugh M. Wolflin has been placed in charge of all rescue work of the Bureau of Mines, succeeding James W. Paul, who resigned from the bureau several months ago. In this position, Mr. Wolflin, under the direction of the Chief Mining Engineer, George S. Rice, has charge of the movements of the rescue cars, the training of miners in rescue and first-aid work, and of all of the Bureau of Mines rescue crews at disasters, cooperating with the State authorities.

Before assuming this position Mr. Wolflin was the engineer of the bureau in charge of the cooperative accident work with the State of California.

MINE WORKERS TOLD HOW TO GUARD AGAINST DISEASE

The "safety first" movement has become firmly established at most mines and needs no argument to defend it or to show why it is needed. The placing of danger signals, putting guards or bars around open places, care in the handling of explosives, and the many other precautions of "safety-first" work are all plain common-sense acts that should not require much explanation. That "an ounce of prevention is worth a pound of cure" is well demonstrated in the results obtained by the "safety-first" movement in preventing accidents, suffering, and death.

To impress the miner with the need of taking similar care to keep well is more difficult, because the need of such precautions is not so readily seen. A circular, one of a series of publications on health and sanitation in the mineral industries, just has been published by the Bureau of Mines in order to call attention to the causes and the symptoms of some dangerous diseases found in mining towns, how these diseases are spread, and what precautions the miner can take against them.

RESPONSIBILITY OF THE MINER

The miner, in common with other workers, has two dangers threatening him nearly all the time. One is injury and the other is sickness. Either one means loss of time, loss of money, suffering for him, and perhaps for his family, and even death, with a widow and children left without income. Miners are coming to realize that most accidents are unnecessary, that they can be prevented, and the "safety-first" movement has lessened them enormously. But most miners do not know that sickness is just as preventable as accident—often more so. Many risks incident to miner's work can not entirely be done away with, and some accidents will happen in spite of the utmost care; but as regards some of the disease that affect miners there need be absolutely no risk. If proper care and attention are paid to the means of preventing sickness, it can be avoided as easily as accidents. These are some of the points brought out by the report which is known as miners' circular 20.

In accidents the cause and the remedy are often easy to see, continues the report. For example, a bar which was supposed to be a guard for an opening is left down; a man walks by, falls in, and is hurt. The cause of the accident, the result, the remedy, and their relation one to another are plain. In many cases of sickness, the cause is not evident to most men, because they do not stop to consider how the disease is spread and fail to realize the ease with which it may be prevented. Once this is understood, the problem of preventing sickness will be simplified, as has been the problem of preventing accidents, and improvement will follow preventive measures in this case as surely as it has in the other.

The "safety-first" movement has made the miner feel that each man is responsible for not only his own safety, but the safety of all around him. The same principle is true in preventing sickness. Each person is responsible for not only his own health, but the health of those around him. When he neglects or breaks one of the common-sense rules of health he endangers not only himself, but his family and the men who work near him. This circular mentions some diseases that every year cause much sickness and death among miners and describes the precautions that should be taken to prevent such diseases from starting and spreading.

GERMS CAUSE MUCH DISEASE

Now, it is known that much sickness is caused by germs getting into the human system, and that the way to prevent disease is to keep the germs out. Germs are tiny living things; so small, in fact that they can not be seen with the naked eye. It takes 35,000 typhoid-fever germs side by side to form a line 1 inch long. Of course, then, a single germ can not be seen unless a very powerful magnifying glass or microscope be used.

Some people find it hard to believe that there are such things as germs, largely because they do not see them. Miners, however, do not have to see in order to believe. The miner has never *seen* fire damp, but he knows it exists; the miner accepts the testimony of his safety lamp. In a similar way with germs; people should accept the testimony of the microscope.

GERMS AND FILTH ALLIED

Because germs cannot be seen it is difficult to protect ourselves from them. If it were easy, there would be much less sickness. One precaution that is perhaps more helpful than any of the others is to avoid all things unclean. Real cleanliness means many things. It means clean water, clean yards, clean milk, clean food, clean houses, clean air, clean bedrooms, and clean bodies. Long before we had any knowledge of germs instinct warned us to avoid unclean conditions. Now we have learned that germs and uncleanliness are closely related.

The throwing off of waste poisons is one of life's processes. Not only must the waste poisons get out of the body, but they must be kept away. They should be removed from all possible contact with the body. Man cannot flourish in his own defilement.

In early times people did not remain in one place very long. They hunted and fished and then moved on, leaving behind their defilement.

If people cannot move away from the defilement they cause, it must be moved away from them. The wholesomeness and healthfulness of the dwelling site depend upon how quickly the wastes are removed from near it.

MOSQUITOES

Sometimes old tubs, kegs, and buckets are kept near the kitchen door for holding rain water. These are not only unsightly but they furnish breeding places for mosquitoes, and *mosquitoes may cause sleepless nights, malaria, yellow fever, and skin diseases.*

If it is necessary to collect rain water, it will pay to buy a clean barrel. This should be raised a few inches off the ground to keep it from rotting and should be kept covered during the mosquito season. A little oil, enough to make a film on the water, will keep the mosquitoes from breeding and will not hurt the water for washing.

Tall weeds should not be allowed to grow in the yard or around the house, for they make good hiding places for the mosquitoes during the day. Such weeds may also hide tin cans half filled with water, decaying rubbish and garbage, and sometimes dead animals. Also weeds take the strength from the soil. They do no good and should be kept cut.

It should be remembered that mosquitoes will lay their eggs and breed in a very small quantity of water. Often little tin cans, broken dishes, or bottles which are scattered about the yard will hold enough rain water to furnish breeding places for mosquitoes after much money has been spent in draining swamps and filling in lowlands.

HOUSES SHOULD BE SCREENED

Every means should be taken to keep flies out of the house. Flies breed in and thrive on filth. Disease germs and filth are plastered upon their hairy legs. Don't permit flies to walk over the food. Just before that fly touched the butter it may have dipped its feet in the spit of a consumptive.

Keep your premises clean, screen your houses, and then swat the flies.

WATER

Nothing less than a plentiful supply of pure, wholesome water should be considered in planning the mining villages of the future. A water tap should be placed in every kitchen, and the water should be made safe at the outset rather than after an epidemic of typhoid fever has pointed out this need.

Many people appear to be willing to "take a chance" with their drinking water. In one large city during one year one person out of every 1,000 died from typhoid fever caused mostly by drinking polluted river water. Each citizen perhaps felt that he would not be one of the unlucky ones. If there were 1,000 glasses of water spread out before you, one of which contained an unseen poison which meant death, would you take a chance on picking up one of the safe 999 glasses?

Many people living in mining towns get their water from shallow wells, and the care of the well largely depends on the individuals. The importance of many of the following suggestions will be understood if it is remembered that *water is a food.* It goes directly into the stomach, usually uncooked. Why should we not be just as particular with conditions around the well as we are about our dinner table?

ROCK DUST

Dust is not a disease, but it is the cause of disease. Any hard, sharp rock dust when breathed into the lungs, irritates and cuts them, making many small scars. These scars make the lungs less able to perform their proper duty. Besides, because of the constant irritation, the lungs become inflamed, and consumption is liable to develop. Men who breathe hard rock dust constantly often get consumption. The constant irritation of the lungs weakens them and at the same time gives the seeds of consumption a good chance to grow. The dust breather is also more liable to fall a victim to the careless spitter than the man whose lungs are sound. If he gets pneumonia, his chance of recovery is not so good. The dust breather has to fight not only the effects of any lung disease he may get, but also the harmful effects of the hard rock dust, which is constantly adding to the ravages of the disease.

Working in dust, like exposure, is at times unavoidable, but a great deal, if not most of the dust breathing is due to carelessness on the part of the miner himself who does not realize the danger of so doing, or if he does is indifferent to it. It is another example of failing to keep up the bars around an open place. In dust breathing, however, cause and effect are not so plain—at least they do not seem so to the miner. But the relation is there just the same. The number of deaths from lung diseases among metal miners is much greater than among coal miners and is probably 10 times greater than it ought to be.

What can the miner do to avoid breathing dust? Water drills are being used more and more. In dry drilling with machines it is possible to lay the dust by water lines or by using a squirt gun and water from a bucket, but often men drill with the hole dry rather than turn on the water, because it spatters on them, or makes the place sloppy. If you are drilling overhead, and the water has to come back on you, wear a rubber hat and boots, and if necessary a rubber coat. This is a bother, but it is also a bother to observe all the rules of "safety first"—which save lives. A man working anywhere where there is much dust should wear a respirator if possible, and see that the respirator is in good condition. Respirators are clumsy and more or less of a nuisance, but it is better to wear one than to have consumption. Do not breathe hard-rock dust day after day, because if you do it will disable you in time. Men who can "eat rock dust"—like the men who can "breathe gas"—die young.

BILL REVISING MINING LAWS IS DISCUSSED

(Continued from page 210)

office, and also provides for recording the final declaratory statement or description of the claim as permanently located with the register and with the local county recorder if required by the State statute, making practically two public records of every mining location, as the States now very generally, perhaps with one exception, require a record of mining locations.

PROVIDES FOR REPEAL

Objection No. 8. The bill provides for an appeal from the land office in case it should refuse a patent for any reason, to the court of competent jurisdiction and if the court on the proof offered by the locator determines he is entitled to a patent it must be issued on the order and judgment of the court.

Objection No. 10. This objection is taken care of in the first place by a provision requiring an entry and payment within seven years from the date of permanent location, and in the second place, by preventing a relocation by any person for or in the interest of any locator or owner and by requiring a relocator to make and file with the proper register an affidavit to the effect that he is wholly disinterested and that the relocation is not made for or on behalf of, or in the the interest of any other person.

Objection No. 11. The tunnel locations as provided for in Sec. 2323 of the existing law is entirely abrogated, but a locator is given the option to construct a tunnel for the purpose of working and developing his location as made and marked upon the surface.

Aside from the provisions for meeting these specific objections the bill wisely provides that in any case where a locator has not made a discovery of minerals within the period prescribed by the bill, he may, on an *ex parte* application to the judge of the nearest court, obtain an order in the nature of a license extending the time for his exploration and discovery work.

AS TO PLACERS

Sec. 2333 of the existing law gives the right to a third person, under certain circumstances, to locate or hold a vein or lode within the limits of a placer claim. This has been the source of much trouble and disturbance and is entirely changed, and a placer location made in good faith carries with it all mineral deposits of whatever kind.

The present bill preserves the distinction between lode and placer claims and if the locator of a lode claim discovers placer ground, or vice versa, he must then change his location to meet the requirements of the law and adapt his claim as discovered to the proper surface location as provided

This bill presents certain questions which the person interested in the mining enterprise must to some extent agree upon. These questions may be stated as follows:

1. Should the locator be limited to one claim 2,100 feet square?

2. Should the locator be limited to five claims 1,500 by 600 feet?

3. Should the locator be given one full year in which to make a discovery, in view of the fact that provision is made for an extension of the time for discovery?

4. Should there be any difference in the number and size of claims permitted to be taken?

5. Should the locations be limited generally or be limited to a State or to a particular mining district?

6. Should a locator be required to develop a claim as a condition for locating other claims?

7. Should any limitations be placed on extralateral rights, that is, on the right of a locator to follow his vein on the dip into the claim of another locator?

8. Should the right of a locator to follow his vein on its dip into the location of another be limited to junior locations only?

9. Should a locator be permitted a given time in which to swing his claim in order to obtain advantage of the dip of the vein after discovery?

10. Would it work a greater hardship on the prospector to limit him to the vertical planes of his original location with the possible limitation to a small part of the dip of a vein than to give him the right to swing his claim, and thereby deprive third persons of the right of locating claims within the limits to which he would be entitled to swing his claim?

11. Should a locator be deprived of his extralateral rights on the expiration of any given period unless he is working his claim?

12. Should a locator be required to locate and develop his vein into and through another claim as a condition on which he could follow the vein on its dip?

If persons interested in the location and development of mining claims can arrive at an agreement to any reasonable extent on these questions, or on any of them, it may be confidently asserted that the bill will be revised and improved to conform to any conclusions that may be reached

SUB-COMMITTEE NAMED

A sub-committee consisting of Representatives Foster, Taylor, James, Wickersham and Hamlin has been named to consider the Foster bill The sub-committee will not begin considering the bill until an opportunity has given to hear from the mining men of the country with regard to the changes in the law which are proposed in the pending bill

Representative Taylor, while he was one of the most determined exponents of the Commission which was to study the question of the revision of laws before undertaking legislation, is not allowing the failure of his bill to interfere with bringing the Foster bill to the attention of as many mining men as possible.

Mr. Taylor is sending to a large number of mining men a copy of the bill and the following letter:

"You probably know that the American Mining Congress and nearly all associations of mining men in the United States have for the past ten years been vigorously urging Congress to pass a bill authorizing the President of the United States to appoint a commission of high-class practical mining men to go out and thoroughly investigate the operations of the mining laws and mining conditions throughout the Western States and Alaska, and make recommendations to Congress for amendments, and a revision and modern codification of our mining laws. Scarcely any changes have been made in the mining laws during the past forty years, and many provisions of those laws are generally looked upon by mining men as being now obsolete and not at all adapted to new metals or modern mining conditions. A great many prominent mining men and mining lawyers are firmly convinced that our mining laws seriously retard instead of aiding mining development in the West today; and many prospectors feel that present conditions hold out very little encouragement to them.

"In response to that sentiment I have had pending before Congress for several years a bill providing for the appointment of such a mining commission. I had it favorably reported in the last Congress, and the Senate this session passed a similar bill, introduced by Senator Smoot; but the House Mines and Mining Committee has, after an exhaustive hearing, refused by a vote of seven to six to approve either my bill or that of Senator Smoot, and in lieu thereof has appointed a subcommittee of five to investigate and consider the whole subject and make recommendations to the main committee, as soon as we can consistently. This action does not accord with the general desires of the West, and was over my vigorous opposition. However, that is the present sentiment of a majority of the committee, and the subcommittee is Foster, Taylor, Hamlin, James and Wickersham.

"I am not criticising the action of a majority of my colleagues on the committee. In fact, generally speaking, I heartily coincide with their principal objections to my bill, namely, that the country is getting tired of creating so many expensive commissions; and, moreover, if the metalliferous mining people know what changes they want, or what new laws they want, and will agree upon them and will let this committee know, it is our duty to enact promptly those laws without waiting indefinitely on the report of a commission. On the other hand, if the mining people have no concerted determination as to what they want, there is no reason for Congress appointing a commission, or doing anything else. Roosevelt appointed a mining commission and after they had worked a couple of years, Congress did not pay enough attention to it to have its report printed.

"Chairman Foster, with the assistance of several prominent mining attorneys and practical mining men, has prepared a bill incorporating the main amendments to the mining laws that have been most generally recommended to the committee. That bill has been introduced by Dr. Foster as H. R. 12275. Our subcommittee has sent out a large number to all state and local mining associations for distribution. I have had nothing whatever to do with the preparation of the bill. It is a tentative draft only, prepared in that way for the use and convenience of the subcommittee, and we are sending it out over the country to all mining communities of the West and Alaska, and asking the mining associations and mining men, miners, prospectors and everybody who is interested, to consider the measure carefully, and all of these proposed amendments and frankly make recommendation to us upon the subject.

"While we are writing the entire West to consider this matter, I am personally especially interested in having every mining man in Colorado carefully investigate all these proposed amendments and feel free to criticise them in every way. My thought is that there may be something good in this bill, and if any of these amendments would be beneficial, and the mining men and attorneys will let me know, I will try to secure their adoption, and will at the same time try to prevent the adoption of all amendments that they deem unwise or unnecessary.

"The sentiment of the western states and different mining districts is widely different. Some states and districts want one set of amendments and others denounce those and want other amendments. We never can please all of them. My judgment is that Colorado will disapprove of most of these suggested amendments. But even if we disapprove of nine-tenths of them, that is no reason why we should not favor those, if any, that will aid mining development, and we may suggest others that are not contained in this bill. If Congress can pass any law that will benefit the mining industry, I know the committee is exceedingly anxious to do so. There is no use now of our talking about obtaining a mining commission from this Congress. So if there are any amendments of the mining laws that Colorado wants enacted, we have a possible opportunity of obtaining them in this bill. I feel a very great personal responsibility in this matter because of the fact, as you will observe, that with the exception of the Delegate from Alaska, I am the only one on the committee who resides west of Missouri.

"Owing to the far-reaching importance of this subject to the metalliferous mining interests of the West, I would like to see the press give the matter suitable mention so that all mining men, engineers, attorneys and the public generally may be fully advised of the situation. And I would be glad also to have the mining men know that I am exceedingly anxious to cooperate with them in every way I can in considering the subject. In other words, this is a commendable effort on the part of the Mining Committee to render if possible an important service to the metalliferous mining industry, and I hope the West will study this Foster bill and then give me their opinion on it. That opinion undoubtedly will have great determining weight in the course of mining legislation for some time to come.

"The Committee desires to report this bill in some form before the close of this session of Congress, and I would like to have all objections and suggestions specifically stated in detail, with the reasons therefor, so that I can present them clearly to the the committee and have them go into the printed records."

In referring to the Foster bill, providing for revision of the mining laws, the *Nation's Business*, the official organ of the Chambers of Commerce of the United States, has the following to say:

"The present laws defining the rights of miners upon the public lands, however well adapted to conditions at the time of their enactment forty years ago, have given rise to much litigation and have resulted in recent years in practical difficulties regarding the procedure by which various kinds of valuable deposits can be acquired. Last December representatives of a number of commercial organizations, societies of mining engineers and metallurgists, and government bureaus met in Washington and advocated a revision of all the laws under which mineral deposits on the public lands are acquired and worked. Subsequently, a bill creating a commission to make such a revision passed the Senate. The House Committee on Mining, however, decided against such a commission, and determined itself to attempt the task.

"On February 25 the chairman of this committee introduced a comprehensive bill which he himself has tentatively drafted. In a comprehensive way this bill endeavors to deal with extralateral rights, by which the owner of a mining claim now may follow a vein appearing on his ground to any distance in its diagonal downward course beneath adjoining claims, and which have given rise to many law suits, creates opportunity to explore for mineral deposits that do not appear at the surface and makes numerous other changes in present law. It is understood that hearings will be held before this bill, or any other of like purpose, is reported from commitee."

Attend Chemical Meeting

A number of scientific men connected with government bureaus attended the fifty-second meeting of the American Chemical Society held at the University of Illinois, April 18.

New Laboratory Equipped

A laboratory has been equipped at Salt Lake City by the Bureau of Mines for microscopic and mineralogic work relating to ore dressing and metallurgy.

NEW CALUMET LEACHING PLANT EXCITING INTEREST

Considerable interest is being shown in Washington in the new leaching plant under construction by the Calumet & Arizona Mining Co. on its New Cornelia property. As this plant represents the last word in progress along this line of treatment special attention is being given to the details of its construction.

The leaching plant will contain eleven lead-lined leaching tanks each eight-eight feet square by fifteen feet deep. Each will have a capacity of 5,000 tons. There will be one sludge tank of the same dimensions. Each leaching tank will have its pumping equipment for the circulating and advancing of its solution at the rate of 8,000 gallons per minute. The leaching tanks will be arranged in two rows with a central structure between, which will support the conveyors conveying the ores to the tanks and the circulating pumps and necessary launders. After the copper is extracted from the ore and the tailings washed and drained, they will be hauled into cars by an excavator of the Hulett type. The tailings will be hauled to the dump in side-dump cars on the afternoon shift, the cars and locomotives used at the mine on the morning shift being available for this service.

The plant will have five wash-water and acid-solution storage tanks of 130,000 gallons capacity each.

There has been considerable falling off in the amount of development work at many of the copper mines of the country as practically all of the operators are engaged in mining and marketing as much ore as possible at present prices. While a few properties are being gutted, the tendency is not to keep development work so far ahead as would be the case under normal conditions. This applies particularly to the Michigan mines, according to information reaching Washington.

At Bingham development is of a different type and is being carried on practically as usual, reports to Washington indicate.

There are a large number of small copper properties being opened and the tonnage from these properties is already assuming considerable proportions. Reports from the Geological Survey indicate also that many copper properties which had been abandoned are now able to operate due to the more favorable price.

Reparation Awarded

In case No 8021 of the Wilhoit Refining Company, of Springfield, Mo., vs. Missouri, Kansas & Texas Railway Co., the rate of 13 cents per 100 pounds charged for the transportation of crude petroleum oil in car loads from Cushing, Okla., to Joplin, Mo., was found to have been unreasonable and unjustly discriminatory to the extent that it exceeded 10 cents per 100 pounds. Reparation was awarded.

Recent Legal Decisions

OUSTING JURISDICTION OF COURT

The Iowa workmen's compensation act is not invalid because it ousts the courts of all jurisdiction to try controversies between employers and employes. Even if it did this, the acceptance of the act is elective and when rejected the full dispute between the parties may be submitted to a court by ordinary proceedings and tried in the usual manner; and while some rules of procedure are changed, some defenses are eliminated, and there is some change in the burden of proof, yet the objection is not sustained that on rejection of the act the courts no longer have jurisdiction to try suits for the injury of an employe. It is true that when the statue is accepted it does operate to take from the courts so much of the controversy as is determined by applying the statutory schedules through the agency of the statutory arbitrators; but it does not constitute an agreement for complete ouster of jurisdiction of the courts to provide by contract for the arbitration of special matters, leaving ultimate lability or non-liability to be settled by the courts. But the very basis of power to award compensation under the act is that its provisions must first be accepted and that the claimant must be an employee and that he must have sustained personal injuries arising out of and in the course of the employment and that the compensation shall be at rates fixed by the statute, and arbitration is only provided for when the employer and employee failed to reach a agreement in regard to compensation under the act. The utmost the statute does is to provide administrative machinery for applying rates of compensation fixed by the legislature as between the parties who have agreed to have the amount of compensation thus determined.

Hunter *vs.* Colfax Consolidated Coal Co. (Iowa), 154 Northwestern, 1037, p. 1063, November, 1915.

OPERATOR'S FAILURE

The Iowa workmen's compensation act provides that where both the employer and employee reject its provisions the liability of the employer shall be the same as though the employee had not rejected it; but it contains another provision to the effect that if the employee rejects he must suffer, in his suit for damages for injuries, the employer's right to plead and rely upon any and all defenses, including those at common law, and the rules and defenses of contributory negligence and assumption of risk and fellow servant, with perhaps certain limitations; and it is further provided that compensation under the act is to be awarded only if both have done what amounts to acceptance of the act. Construed as a whole the act does penalize the employee who rejects it and while the penalties imposed upon the employer and employee may not be precisely the same, yet this is not vital and does not sustain a broad charge that an arbitrary difference is created as to the consequences of conduct, which is, in substance, alike. But were it otherwise the police power may be invoked to sustain some differentiations in favor of the employe, on the theory that this is a method of protecting him for the public good against the actual inequality between him and his employer.

Hunter *vs.* Colfax Consolidated Coal Co. (Iowa), 154 Northwestern, 1037, p. 1053, November, 1915.

RECKLESS OPERATION OF MOTOR

A jerk in the operation of a motor and cars in a coal mine which is vile, unusual, and unnecessary, is evidence from which negligence on the part of the person operating the motor may be inferred.

Nebo Coal Co. *vs.* Barnet (Kentucky), 180 Southwestern, 79, p. 80, December, 1915.

JERKS OF MOTOR

An injury received by an employee from an ordinary and necessary jerk in the operation of a motor and coal car in a mine is a risk assumed by the employee but an injury which results from a violent and unusual and unnecessary jerk does not arise from such assumed risk, and the jerk by a motor operating upon the coal cars which is violent, unusual and unnecessary may be evidence of negligence on the part of the person operating the motor; and where a jolt was received by a coal car thereby causing the injury complained of, was unusual, violent, and unnecessary, the miner suing for such injury is entitled to have his contention upon this subject submitted to and determined by a jury.

Nebo Coal Co. *vs.* Barnett (Kentucky), 180 Southwestern, 79, p. 80, December, 1915.

GROSS NEGLIGENCE

Under the Kentucky rule injuries which are caused to a miner or an inferior employee by the gross negligence of his superior employee, are imputed to the employer or mine operator, and such an employee does not assume the risks of danger which arise from such gross negligence in an employee superior in authority to himself; but this rule is limited to the case where such superior employee has the immediate control of and supervision of the injured employe, and does not extend to cases where the superior employee's ordinary negligence causes injury to an inferior employee who is not immediately under his control and supervision.

Nebo Coal Co. *vs.* Barnett (Kentucky), 180 Southwestern, 79, p. 81, December, 1915.

NEGLIGENCE OF FELLOW

A miner or other employee, when he undertakes employment so far as the mine operator is affected, assumed all the risks from injuries to himself which are caused by the negligence, either ordinary or gross, of his fellow servants who are upon the same plane of equality as himself as to authority and engaged in the same work; and he likewise assumes all risks of injuries which may arise from the ordinary negligence of a superior employee in the same work as himself where the negligence does not result in death.

Nebo Coal Co. *vs.* Barnet (Kentucky), 180 Southwestern, 79, p. 81, December, 1915.

NEGLIGENCE OF SUPERIOR

The ordinary negligence of a superior servant which results in an injury to a miner, which does not produce death, cannot be imputed to the mine operator.

Nebo Coal Co. *vs.* Barnett (Kentucky), 180 Southwestern, 79, p. 81, December, 1915.

FELLOW SERVANT OF EQUAL GRADE

A mine operator is not liable to a miner for injuries incurred by him on account of the negligence, either ordinary or gross, of a fellow servant in the same work and occupying the same situation as to authority as himself.

Nebo Coal Co. *vs.* Barnett (Kentucky), 180 Southwestern, 79, p. 81, December, 1915

INJUNCTION

A coal mining company is entitled to a temporary injunction restraining a mortgagee from foreclosing his mortgage executed by it on the purchase of a mining lease, where the mortgagee induced the complainant to purchase the lease and execute its note and mortgage on false and fraudulent representations that he would cause all liens against the mining property to be satisfied and fraudulently represented that certain bonds secured by a trust deed on the mining property matured in eighteen months, the time the defendant's note and mortgage should mature, and that complainant could thereby protect itself, and where the defendant as a further inducement to complainant to purchase the mining lease and execute to him its notes and mortgage promised and agreed that the time on the note and mortgage held by him should in any event be extended until the date or after the date of the maturity of all indebtedness and liens against the mining property, and where it subsequently appeared that the bonds secured by the trust deed did not mature until two, three and four years from the date of the note and mortgage executed by the complainant and that the defendant refused to extent the time of the maturity thereof according to his promise and was in fact proceeding to foreclose his mortgage by advertisement, and the complainant is entitled or the facts stated and the fraudulent representations contributed as an inducement to the execution of the note and mortgage maturing as they did and a reformation of his note and mortgage in conformity with the defendant's promise of extension and an injunction restraining a premature foreclosure of such mortgage.

Consumers' Coal & Fuel Co. *vs.* Yarbrough (Alabama), 69 Southern, 897, p. 899, October, 1915.

DOES NOT INCLUDE GAS

An oil and gas lease executed upon a certain stated consideration provided further that the lessee was to pay to the lessor a certain stated sum within 90 days after a well for oil and gas is drilled and oil produced in a pipe line in paying quantities, and to pay a like sum within 90 days after each paying well thereafter is drilled until the payments amount in all to a certain stated sum, does not require the lessee to pay the stated sum where a well was drilled on the premises which produced gas only.

Ball *vs.* Freman (West Virginia), 87 Southeastern, 91, November, 1915

CONVEYANCE TO TRUSTEES

A deed of land to nine persons named as trustees of a mining corporation does in effect convey the land to the trustees for the mining corporation and not to such trustees for their own benefit.

Troy & North Carolina Gold Mining Co. (North Carolina), 87 Southeastern, 40, p. 41, December, 1915.

DRAINING ADJOINING LANDS

While oil wells drilled and operated may, by reason of their proximity to a division line, in fact drain oil from adjoining lands, yet such operations, in the absence of special circumstances or relations between the parties, offer no basis for a claim to a share in or an accounting for the oil so produced, or for a receivership for the operation of the wells so drilled.

Cain *vs.* South Penn Oil Co. (West Vir

ginia), 86 Southeastern, 883, p. 885, October, 1915.

See Fairbanks *vs.* Warrum (Indiana Appeals), 104 Northeastern, 983, p. 986.

FRAUD NOT IMPUTABLE

A lessee who obtained an oil and gas lease from the owner of land and who was unable to obtain a lease from the adjoining land owner, is not to be charged with fraud by the latter and is not liable to such adjoining land owner for any part of the oil produced by him from wells on the leased land, though located so near the line as to drain the oil from the adjoining premises, and the mere execution of such a lease causes no inference of fraudulent intent and justifies no implication of a purpose on the part of the lessee to wrong the adjoining land owner.

Cain *vs.* South Penn Oil Co. (West Virvinia), 86 Southeastern, 883, p. 885, October, 1915.

See Fairbanks *vs.* Warrum (Indiana Appeals), 104 Northeastern, 983, p. 986.

EVIDENCE TO SUPPORT VERDICT

Where a mine owner and operator had mined out and completed according to his plan of work certain entries or rooms in its mine, the evidence of an injured miner to the effect that he was expressly directed to enter such abandoned part or room, without any knowledge on his part that it had been so abandoned and where there were no sufficient visible indications of its abandonment, and was there injured in the course of his employment, is sufficient to sustain a verdict in his favor as against a demurrer to the evidence.

Osburn *vs.* Darby Coal Mining Co. (Virginia), 86 Southeastern, 834, p. 835, November, 1915.

FAILURE TO WARN MINER

A mine owner and operator has the right to abandon places in his mine which have been completed according to the plan of the work and if a room in which a miner was directed to work had been abandoned, there being no sufficient visible indications of its abandonment, the mine owner would be liable for negligence to a miner entering such abandoned part or room and was injured in the course of his employment, if the mine operator failed to give due and timely warning of such abandoned part or room.

Osborn *vs.* Darby Coal Mining Co. (Virginia), 86 Southeastern, 834, p. 835, November, 1915.

SALE OF PROPERTY

Where a corporation organized for the purpose of operating mining claims owned by it, sold and transferred all its mining claims and where it has ceased to do business and its property is liable to be wasted, a receiver is properly appointed to wind up the corporation.

Murphy *vs.* Utah Mining, Milling & Transportation Co. (Maine), 95 Atlantic, 887, p. 888, December, 1915.

DISSOLUTION ON ORDER OF COURT

A mining corporation is properly dissolved by a court on application of a stockholder where by reason of the gross mismanagement of its affairs it was in imminent danger of insolvency and danger that the estate and effects would be wasted, and because it had ceased to do business.

Murphy *vs.* Utah Mining, Milling & Transportation Co. (Maine), 95 Atlantic, 887, p. 888, December, 1915.

FREEDOM FROM NEGLIGENCE

The Iowa workmen's compensation act provides that the only negligence of an injured employee which is available as a complete defense in negligence which is self-inflicted or injury which is the result of intoxication; but the employer is at liberty to prove that, either by reason of the negligence of the plaintiff, or for any other reason, he was wholly free from fault. While under the act it was to be presumed that the proximate injury of the employee was the direct result of negligence on the part of the employer, and the burden of proof is cast upon the employer to rebut this presumption, and to show affirmatively that no negligence of his caused the injury. The rules as to presumptions and burden of proof are court-made and can be changed or abrogated by the legislature; and if the court could place the burden on the injured employee to prove his freedom from contributory negligence, the legislature may abolish this rule and place the burden upon the employer to show that he was not negligent.

Hunter *vs.* Colfax Consolidated Coal Co. (Iowa), 154 Northwestern, 1037, p. 1065, November, 1915.

CONTRIBUTORY NEGLIGENCE

The Iowa workmen's compensation act abolishes the doctrine that an injured miner cannot recover because of contributory negligence on his part, however slight, though the negligence of the operator may be great or gross. But the statute has in fact added to the defense of contributory negligence rather than subtracted from it, and but for this statute all contributory negligence would be available in mitigation of damage, and under this statute there is a right to plead it in mitigation, plus the right to plead some contributory negligence in bar and recovery may be defeated by showing the employee's willful intention to injure himself or where the intoxication of the employee was the proximate cause of the injury. But in any event a statute abolishing such defenses as contributory negligence, assumption of risk, and the negligence of fellow servants, only where the employer being free to accept or reject the statute, violates no constitutional rights.

Hunter *vs.* Colfax Consolidated Coal Co. (Iowa), 154 Northwestern, 1037, p. 1066, November, 1915.

TRIAL BY JURY

The Iowa workmen's compensation act does no accomplish a denial of the right of trial by a jury and particularly in cases where the employer rejects the compensation statute; and the fact that the statute accomplishes giving the jury less to do than formerly, and changes the character of its work, in that a jury will no longer consider whether the employee should be defeated because the evidence shows he assumed the risk of being injured as he was and can not consider the question as to whether the alleged injury was due to the negligence of a fellow servant nor whether the injured employee has proved that his injury is due to the negligence of the employer, but begins its inquiries by assuming the employer was negligent and then considers whether the employer has proved, notwithstanding this presumption, that he was wholly free from fault. It is clear that this does not deny trial by jury, but merely changes the rules under which such trial shall proceed.

Hunter *vs.* Colfax Consolidated Coal Co. (Iowa), 154 Northwestern, 1037, p. 1066, November, 1915.

WORKMEN'S COMPENSATION

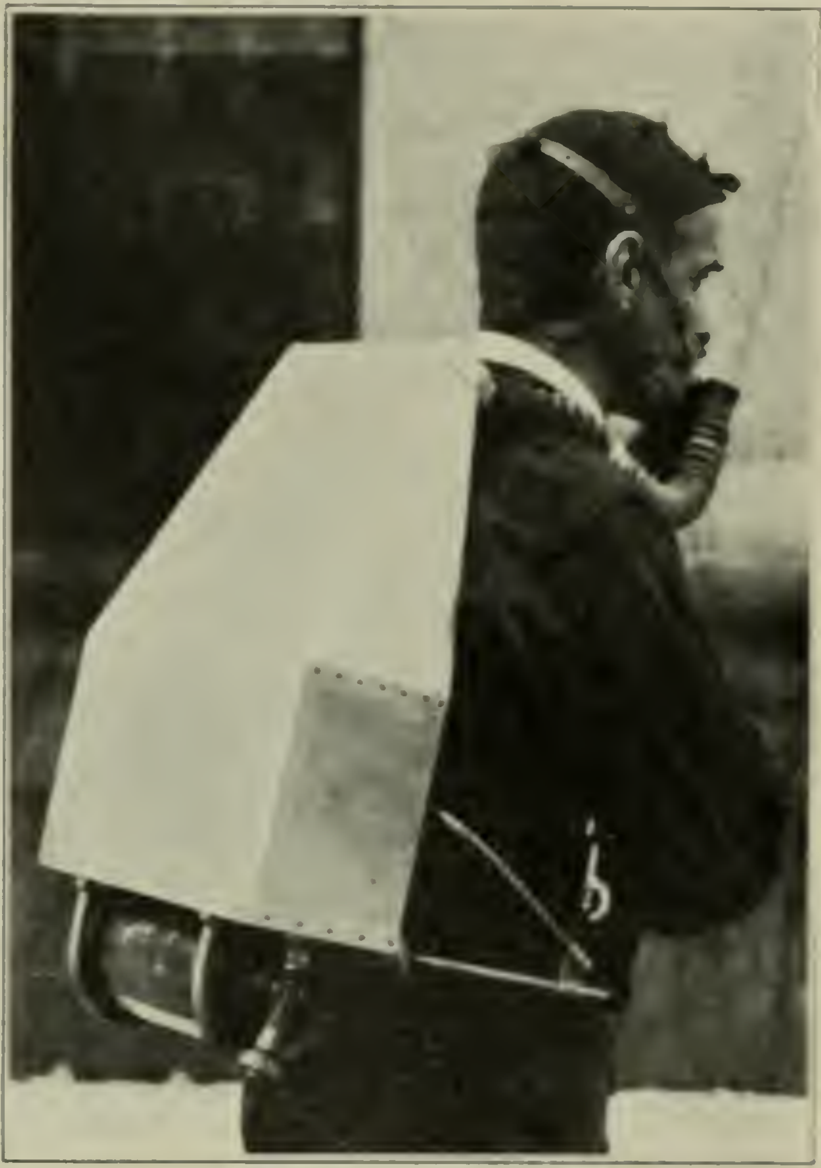
The Iowa workmen's compensation act is not subject to the charge of unconstitutionality on the ground that it compels an employer to accept its provisions and then deprives him of certain rights. The statute does not compel acceptance, but it does provide that the presumption that the employer has elected to accept its provisions prevails unless certain prescribed notices are given by him, but this does not compel him to accept the act, but is merely a provision as to what he must do to avoid a presumption that he has accepted it; and the claim is wholly immaterial where a complaining corporation concedes that it has rejected the provisions of the statute.

Hunter *vs.* Colfax Consolidated Coal Co. (Iowa), 154 Northwestern, 1037, p. 1068, November, 1915.

DISADVANTAGE OF EMPLOYE

The provision of section 3 of the Iowa workmen's compensation act as to the presumption arising when an employe rejects the benefit of the act and the provision of section 19 as to the presumption of fraud in a contract of settlement made by an injured miner, cannot be said to interfere with the right to contract, as the legislature having power to enact a valid compensation act always has power to make provisions against having the legislative intent as to such act thwarted, and to put the ban on such influences interferes with no right of contract, but simply heads off methods of evading and crippling the act. One underlying purpose of the act is to promote acceptance by the employe of the benefits of the act and the provision of section 19 is an attempt to prevent fraud in dealing with an injured employe and is intended to guard against the nullification of the act through the employer's obtaining a contract to the disadvantage of the employe when he may be physically and financially in distress; but the act does not in fact prevent or make void the contract but only makes it presumptively fraudulent, merely changing the burden of proof as to the validity of such contracts.

Hunter *vs.* Colfax Consolidated Coal Co. (Iowa), 154 Northwestern, 1037, p. 1050, November, 1915.



NEW BREATHING APPARATUS
Developed by the Bureau of Mines

New Mexico Coal Rate Suspended

The proposed increase in rates on coal from Raton and other points of origin in New Mexico to certain stations located on the Trinity & Brazos Valley Railroad, has been suspended until October 8.

Current Traffic Developments

Hearings of interest to the mining industry are under assignment by the Interstate Commerce Commission as follows:

Washington. May 1. Examiner Marsh. 8725. Lake cargo coal rates. 8598. Pittsburgh Coal Operators, Association *vs.* Pennsylvania Company.

Washington, May 15. Oral argument. 6890. Coal Operators Traffic Bureau of St. Louis *vs.* Terminal Railroad Association.

Washington, May 17. Oral argument. I. & S. 740. Coal to Missouri stations.

In case number 7921 of the Progressive Metal & Refining Company vs. the Chicago & North Western Railway Company the commission found that the rate charged for the transportation of scrap copper and scrap brass in carloads and of scrap brass and slab zinc dross in mixed carloads from Chicago, Ill., to Milwaukee, Wis., is unreasonable. A reasonable maximum rate was prescribed for the future. Reparation was denied.

In case No. 7853 of the Oklahoma Fuel Company vs. Fort Smith, Poteau & Western Railway Company, the commission found that the charges collected for the transportation of one carload of coal from Whitteville, Okla., to Gould, Okla,. reconsigned to Wellington, Tex., and returned to Gould, not to have been unreasonable. The complaint was dismissed.

Pensylvania Request Denied

Application for authority to establish rates on bituminous and cannel coal from points on the Pennsylvania Railroad and its connections to water competitive points on the Maryland-Delaware peninsula lower than rates contemporaneously applicable on like traffic to intermediate points has been denied.

Demurrage Charge Refunded

In case No. 7694 the C. Reiss Coal Company, of Sheboygan, Wis., *vs.* Ann Arbor Railroad Company, demurrage charges, due to inadvertent cancellation of free-time provision, collected on coal in carloads held for reconsignment at Frankfort, Mich., were found to have been unreasonable and reparation was awarded.

Prescribes Maximum Rate

In case No. 7933 of the Consolidated Fuel Co. of Hiawatha, Utah, *vs.* Atchison, Topeka & Santa Fe Railway Co., the commission finds that the defendants' rates for the transportation of soft coal in carloads from Mohrland and Hiawatha, Utah, to California points on the Atchison, Topeka & Santa Fe's branch line from Los Angeles, Cal., to National City, Cal., to be unreasonable. A maximum joint through rate of $6.65 per net ton is prescribed.

Makes Nondiscriminatory Rates

In case No. 7804, of E. Rickards, of Norfolk, Va., *vs.* Seaboard Air Line Railway, the rates for the transportation of mine-prop logs in carloads from Thelma and Vaughan, N. C., to Portsmouth, Va., were found to have been unreasonable and unjustly discriminatory. Reasonable and nondiscriminatory rates were prescribed for the future.

"SAFETY-FIRST" EXPOSITION READY FOR ITS TOUR

Arrangements have been completed by the government to send out May 1 a traveling exposition of "safety first," consisting of twelve steel cars filled with exhibits showing the work of the various Federal bureaus along humanitarian lines.

Space in the "safety first" special is divided among the exhibits of the Bureau of Mines, the Public Health Service, the United States Coast Guard, the Forest Service, the Navy and War Departments, the American Red Cross, the Weather Bureau and other Government agencies. Motion picture shows, depicting the work of the United States, will be given aboard the train every evening.

The train eventually will traverse most of the United States.

WESTERN LIGNITES OFFER PROMISING FUEL SOURCE

To one thoroughly familiar with the great extent of the western lignite deposits, their limited development, and the comparatively simple methods that have thus far been adopted in their utilization as fuel, any investigations looking to a possible and increased utilization of these vast deposits must at once be considered of great economic importance. There is no doubt that much can be done toward improving the methods of burning now in use, and in providing means for using the coal in other forms, such as in a pulverized state, or in the manufacture of producer gas, or of by-product gas, or as residue briquets. Especial attention has been given by E. J. Babcock, of the Bureau of Mines, to the study of utilizing the lignite in the form of residue briquets and in the manufacture of by-product gas, because in this method there appear excellent possibilities of providing a satisfactory and efficient fuel and of recovering numerous by-products.

From the results obtained by the methods being developed at the school of mines and the substation of the University of North Dakota there seems little doubt but that the briquetting and the production of gas from lignite can in the near future be put on a commercially satisfactory basis.

CALIFORNIA INSPECTOR OPENS CORRESPONDENCE WITH MINERS

Edward Higgins, State mine inspector of California, sent out the following letter, under date of March 15, to every mine worker in his State:

"Maybe you will not be looking for a letter from me, but I have a good reason for writing. I want to get in close touch with you and this is the only way I can do it. I hope you will read this to the last word. If you do not you will miss the 'Safety Bear.' I believe that every one of you, except he whose strength is entirely below his Adam's apple, will agree with what I am about to write.

"You have all heard of the great safety wave that has been sweeping over this country of ours. You know that the Federal and State governments, various societies and many mining companies are putting forth efforts to reduce accidents in the mines. In many mining districts this safety wave has already drowned out a large per cent of accidents, and that is good for the miner.

"In talking about safety with men in the mines I have often heard the remark: 'What's the use? What do we get out of it? The company is the only one that is benefited.' Now, right here is where a big mistake is made. I submit that the miner is far and away the greatest gainer from safety work.

"Here are the facts: The governments and societies spend large sums of money every year in trying to make the mines safe, but there is no way for them to get a cash return for their efforts. Mining companies also are spending many hundreds of thousands of dollars yearly for the same object. Those that carry casualty insurance have little to gain. It is true, however, that those companies carrying their own insurance do save money by reducing accidents to employes. What if such companies do save a little money? It is not a drop in the bucket when placed side by side with the reduction of misery and suffering to the miner and those who depend on him.

"What is compensation? You who have a family; is there anything that can compensate you for the loss of your life, for the loss of a leg, or a hand, or the mutilation of any other part of your body? Is there anything that can compensate you for walking around on a wooden leg, or for having to stand on a corner with a tincup tied around your neck asking help because you are blind? You who have not yet married, what chance have you to secure a loving wife with your looks spoiled by a blasted face, or by the loss of half of your teeth, or an eye, or an ear? There is no money compensation for such injuries.

"The day is coming soon when the mines in this State will be made as safe as possible. The work may be slow—but it is sure. Now, while I believe it is a great thing to have the mines put in a safe condition, I am a firm believer in the fact that safety in mines cannot be had without the active help of you miners. What good are safety devices if men will not take care of themselves? I hold that almost the whole problem is up to you boys. Don't take this for criticism, for it is not meant that way. The average miner is careful, but you know, as I know, that there are many careless miners.

"I want you to know that all of the deputy mine inspectors and I have served time below the collar, and that the business end of a muck stick is no stranger to any of us. It follows that we should 'savvy' many things from the standpoint of the miner. As a matter of fact, we not only know what you are up against, but we have a most earnest desire to make things better for you and we are working faithfully toward that end. In other words, we are for you. Without a shadow of a doubt, however, unless you assist us, all of our efforts will avail but little. It would be a great pleasure for me to know that every miner of this State is in sympathy with the work of this office, and I can promise you that the result of such a condition will be a reduction of accidents such as no State in the Union can show. Let us do this thing. The benefits and the credit will be yours.

"The books of the Miners' Safety Bear Club are now open for the entry of members. I would be glad to have every miner in California join this club. Its only constitution is 'Safety First'; its by-laws are 'Think Before You Act'; there are no dues. In order to join it is only necessary for you to send your name to me. It would be a simple matter for some one miner at every mine to make a list of those who wish to join the club. On receipt of such a list I will enroll the names and will send, without cost, to each miner a neat 'Safety Bear' button, which will signify that the wearer is a 'bear' for safety. I cannot too strongly urge you to joint this club. The benefits are too numerous to mention. In the words of the oracle: 'Get aboard while you have your health.' The first 50 names received will be enrolled as charter members. Those who send in the lists will be given honorable mention in the next letter.

"If you have time I would be glad to hear from you, telling me if you like this letter and the 'Safety Bear' movement. There will be other letters as the months go by and every effort will be made to make them of interest and value. Let's get together and make this thing a go.

"In closing I am going to add a few thought blasts which I recommend for your consideration. Some of them will amuse you and others will benefit you."

THOUGHT BLASTS

A first aid man who knew it all was asked: "How would you treat one of your mates who had been badly frostbitten?" The know it all responded promptly: 'Why, rub him with a man who had a touch of sunstroke.'

Look out for the other man, you might hurt him.

Recklessness is no indication of courage; brave men are always cautious.

Ty Cobb says: "No, I do not drink; it dims my batting eye."

Never do anything that you know is dangerous in order to show someone else that you are not afraid to do it.

Look out for the greenhorn and show him how to keep from getting hurt.

Get the safety habit—it is the only habit which will never injure you.

A broken rule usually means a broken bone.

A rusty turned-up nail is in the same class as a poisonous reptile. Turn them both down.

Dynamite or airships are not the most dangerous things in the world. The slipping ladder causes approximately 6,000 deaths and 200,000 accidents every year in the United States. The ladder, carelessly used, is one of the most dangerous things in the world.

MISCELLANEOUS MINERAL MINES REPORT FEW ACCIDENTS

The reports of 240 operators of miscellaneous mineral mines show that these mines employed 9,249 men, of whom 2,465 were employed underground and 6,784 on the surface. The total number of deaths and injuries due to accidents reported is as follows: Deaths, 27, or 2.92 per 1,000 employed; serious injuries, 128, or 13.84 per 1,000; and slight injuries, 596, or 64.44 per 1,000. When compared with the rates for the copper and iron mines, these ratios seem exceedingly low. The reports received indicate that this difference is largely explainable by the mines being small and not keeping complete records, says Albert H. Fay, statistician of the Bureau of Mines. Most of the mines are in States where there are neither State inspection nor compensation laws, and operators are not obliged to keep accident records or to report accidents. Furthermore, about 75 per cent of the men are employed on the surface, the hazards being thus reduced to those of quarry operations. The figures for 1914 show a higher injury ratio than for previous years, indicating that the educational campaign is resulting in more complete records being kept.

CONSERVATION MEETING OF INTEREST TO MINERS

Of considerable interest to mining men will be the conference on the development of national strength and efficiency, to be held by the National Conservation Congress at Washington May 2, 3 and 4.

Since the meeting is called largely with the idea of discussing the mobilization of national resources much attention is to be given to the mining side of the proposition. A number of prominent mining men have indicated their intention of being present.

UTAH MINING DISTRICTS TO BE REPORTED UPON

A detailed investigation of the Cottonwood and American Fork mining districts of Utah have been given first place on the geologic schedule of Utah by Dr. George Otis Smith, director of the Geological Survey. This step was asked in a petition by members of the Utah chapter of the American Mining Congress. Referring to this matter Dr. Smith says:

"All plans for topographic and geologic work for the coming field season are still in the tentative stage. The detailed investigation of the Cottonwood and American Fork districts have been given first place on the geologic schedule for field work in Utah, and it is hoped that work can be started this spring. It will be necessary as a preliminary to this investigation to map on the "mile" (1: 62,500) scale considerable country adjacent to the area covered by the published Cottonwood Special Map, and to extend that map about two miles farther South. It is planned to have the geologists follow up the topographers closely on this work.

"Although every effort will be made to secure prompt results I am afraid that many of the petitioners do not realize that the kind of survey and publication for which they are asking cannot possibly be completed in anything like so short a time as the brief reconnaissance report already issued on the district."

A. S. AND R. INTERESTED IN SAMPLES OF TIN ORE

Since several inquiries have been received at the office of the American Mining Congress as to what facilities are offered by smelters for the examination and analyzing of ores, it perhaps will be of interest to know the attitude of the American Smelting and Refining Co. with regard to this matter.

"We only examine and analyze ores," says W. E. Merriss, secretary of the American Smelting & Refining Co., "submitted to us in cases where the parties are in position to negotiate for sales of stated tonnages for the use of our plants. Our laboratories are so crowded with work that we are not in position to do a general assaying simply for information of prospectors and others.

"As to tin ores, our capacity for some months ahead is already provided for under contracts already made. However, we should be interested in receiving samples of high-grade tin material, with a view to securing information as to future supplies of a suitable material. Any of your correspondents who may wish to submit such samples should forward them by mail or express to American Smelting & Refining Co., Maurer, N. J., with advice to that address and to 120 Broadway, New York."

WASHINGTON SHOWS GREAT INTEREST IN REPORT ON RITTMAN DISCOVERIES

Bulletin Issued by Bureau of Mines Gives Details of Experiments That Have Attracted Attention Throughout the World—Large Scale Experiments Fully Confirm Results Obtained in Laboratory Work

Much interest is being shown in Washington in the report of W. F. Rittman, of the Bureau of Mines, on his experiments and discoveries with regard to refining processes.

Some of the conclusions drawn by Mr. Rittman follow:

It appears that all the products of petroleum from the lightest distillates to the heaviest residuum, including heavy crude oils of an asphaltic nature, such as crude Mexican and California oils, can be successfully cracked and large yields of gasoline hydrocarbons obtained.

It should be noted that the production of gasoline hydrocarbons from a given quantity of original oil is not limited to the first run, but that the residuum above the gasoline fraction can be rerun through the furnace and a like proportion of cracked gasoline obtained. The process may be repeated until finally 50 to 60 per cent of the original oil can be converted into gasoline, as has been repeatedly demonstrated with the small laboratory apparatus used by the authors.

The favorable conditions for gasoline formation seem to be moderate temperatures and high pressures. In commercial work, a temperature ranging between 500° and 550° C. and a pressure of 12 atmospheres and upward will be found suitable, as high a pressure as can be maintained within the limits of safety being desirable, because of the improved quality of the gasoline.

The large-scale experiments have fully confirmed the laboratory experiments and established the fact that the conversion into gasoline can be even more satisfactorily accomplished in a tube of greatly enlarged diameter and increased length than in the electrically heated 1½-inch tube. The conditions favorable for gasoline production are shown to be the same in the larger tubes as in the small tube, namely, a temperature of approximately 500° to 575° C. and a pressure of 250 to 300 pounds per square inch.

The gasoline process, therefore, can justly be considered as a success so far as conversion in the large tubes is concerned. The adaptation of the unit to refinery conditions is a matter of mechanical detail involving no inherent difficulties.

AROMATIC HYDROCARBONS

The data given establish that, as in gasoline formation, all types of petroleum oils, from light distillates to the heaviest residuum, including heavy asphaltic-base oils, can be made to yield aromatic hydrocarbons in commercial quantities. The residuum above the lower-boiling aromatic fraction can be rerun, and the aggregate yields from a given quantity of original oil can be proportionately increased.

The favorable conditions for aromatic formation seem to be high temperatures and moderate pressures. In commercial work a temperature ranging between 625° and 700° C and a pressure of upward of 8 atmospheres will generally be most suitable.

LABORATORY EXPERIMENTS

The results of the experiments led to the following conclusions:

In procuring the desired products of the cracking reaction, the physical and chemical properties of an original oil are of secondary importance compared with the influence of temperature, pressure, time, and concentration.

Under like conditions, practically identical results have been obtained from five different oils, and the differences reported may be attributed, in part, as much to variation in rate of reaction as to the actual production of dissimilar equilibrium products. One exception noted relates to the production of carbon, a residual product, the formation of which seems to be proportional to the quantity contained in the original oil. Viscosities and specific gravities of the oils obtained show in some measure the influence of the properties of the original oils, but the differences are only slight and can perhaps be explained by the system not having been allowed to reach complete equilibrium.

The experiments have indicated the commercial possibilities and advantages of hydrocarbon reactions carried out in a cracking chamber composed of a vertically arranged tube, when the products to be treated are in a gaseous state and are cracked in an atmosphere of decomposition products. The results obtained with large-scale equipment, subsequently described, have demonstrated the correctness of these conclusions.

MULTIPLE-TUBE FURNACES

Observations of the results obtained in a single-tube furnace as compared with those obtained in the 10-tube furnaces have demonstrated the superiority of the single-tube over the multiple-tube arrangement.

No difficulty was experienced in maintaining temperature control over the single tubes, whereas it has been a constant problem to obtain anything like uniformity of heating conditions with the multiple-tube furnace. To get a uniform heat over a small area of the tube it must be heated on more than one side by burners near one plane. This is not possible in the multiple-tube furnace, but is easy of accomplishment in the single-tube type. One side of the tube in the multiple furnace often becomes too hot and the other side too cold. This would not be the case with the smaller installation.

Separate compartments for each tube would, it is believed, be as satisfactory as single-tube furnaces if sufficient combustion space were allowed. The cost of construction would naturally be less if a number of these compartments were constructed as a unit. It is not recommended, however, that more than four such compartments be arranged in a single unit.

Another recommendation in favor of the single tube is the fact that accurate observation of heating conditions is permitted, which is impossible in the multiple type. With the single-tube furnaces a proportionally much larger combustion space can readily be obtained. The larger combustion space will permit a better mixture of the gas and air and will tend to give more uniform heat conditions, owing to the greater distance the products of combustion must travel before reaching the tubes. An outer combustion chamber in which combustion takes place before the gases enter the furnace chamber in which the single tube is set would enable the brickwork in the interior of the multiple furnaces to be dispensed with without any change in the results.

Independent operation of the tubes would permit a tube to be removed or replaced without interfering with the operation of the other tubes. This is difficult in the case of a nest of tubes in a multiple furnace.

REGARDING CONDENSERS

In any new installation for the employment of this process, provision should be made for a condenser of the same type as that used in oil refineries. With the benzene-toluene process, the condensation problem is, however, markedly different from that of the refinery where all the vapors coming from the still are condensible, as in making benzine and toluene considerable volumes of fixed or noncondensible gases are generated. In general a condensing area of approximately 2½ feet for each barrel of original oil used per day will be found satisfactory if a gas scrubber is operated in connection therewith. This gas scrubber can be modeled after the benzine scrubbing towers in by-product coke-oven plants, or may consist merely of a large tank filled with a heavy oil through which the gases are bubbled. This tank should be so inclosed that the fixed gases can be conducted to a gas holder for the purpose of supplying fuel for the furnaces, if desired. In by-product coke-oven practice the introduction of back pressure by forcing gas through a body of oil would seriously affect the coking products, whereas in the process herein described there is sufficient direct pressure to work against any desired head of oil.

NORTHWEST MINING CONVENTION PRAISES LANE AND TALLMAN

The Northwest Mining Convention has adopted the following resolution, recognizing the efforts of the Secretary of the Interior and the Commissioner of General Land Office in Expediting Patents:

Whereas, It is common knowledge in the mining industry that for the past eight or nine years the process of securing United States patents to mineral claims has been slow, cumbersome and expensive, and much beyond the reasonable time and means of the prospector or the young mining company to finance; and

Whereas, Such process has within our knowledge seriously impeded mineral discovery on the public domain, and

Whereas, It has come to our knowledge that the Hon. Franklin K. Lane, Secretary of the Interior, and the Hon. Clay Tallman, Commissioner of the General Land Office, appreciating this state of facts, have succeeded in materially reducing the length of time required for securing patents, greatly to the benefit and encouragement of prospecting and mining. Be it, therefore,

Resolved, That this convention, in mass assembled, express its deep appreciation of the efforts of both the Honorable Secretary of the Interior and the Honorable Commissioner of the General Land Office in behalf of expeditious and businesslike methods in the issuance of mineral patents. Be it further

Resolved, That copies of this resolution be transmitted to the Secretary of the Interior and the Commissioner of the General Land Office.

The Dorr Company Formed

The expansion of the business and professional service of the Dorr Cyanide Machinery Company, due to the increasing use of Dorr machinery in so many varied processes, has necessitated an enlargement of its engineering staff and facilities and made advisable the incorporation of the Dorr Company.

The Dorr Company takes over the patents and commercial business of its predecessor, and will act in a consulting capacity in connection with the design, construction and operation of hydrometallurgical, wet chemical and allied industrial plants and the conduct of technical investigations, according to an announcement from the Denver office of the company.

Current Federal Legislation

A total of 20,735 bills have been introduced thus far at this session of Congress. Of this number 14,999 are House bills and 5,736 are Senate bills.

Owing to the presence of the appropriation bills and the President's program before Congress no bills of interest to the mining industry were reached by either House during the last month.

The greatest activity has been displayed by the House Committee on Indian Affairs, which is considering a number of the mining problems which arise on the Indian lands in Oklahoma and other states. Hearings have been conducted, but none of the bills had been reported out April 25.

The House Committee on Mines and Mining has held no session of the full committee, but Dr. Foster, chairman of the Committee and several members of the Committee have been active in trying to get before the mining men of the country the bill in which it is proposed to make certain changes in the mining laws. The sub-committee of the Committee on Mines and Mining, of which Representative James is chairman, is conducting hearings on Representative Randall's H. R. 175.

The Senate Committee on Public Lands has reported favorably on the Oil Land Leasing Bill, which is now on the Senate calendar, but with little prospect of it being considered at an early date.

The Senate Committee on Indian Affairs also is considering several bills with reference to mining leases on Indian lands.

The Senate Committee on Mines and Mining has held no meeting during the month, and no bills in addition to those mentioned in this column last month have been referred to it.

Senator Sheppard has served notice that he will offer an amendment to the Sundry Civil Appropriation Bill, providing for a special investigation of lignite.

The object of the bill is to secure information as to the most efficient treatment and use, especially with reference to their utilization in producing fuel for internal-combustion engines, and in supplying benzine, toluene, and other basis materials required by the dye-stuff, explosive and related chemical industries. The sum of $50,000 is provided for the purpose.

S. 4825, by Mr. Owen, of Oklahoma. This bill provides for the sale of coal and asphalt deposits in the segregated mineral land in the Choctaw and Chickasaw Nations in Oklahoma. The bill is pending before the Senate Committee on Indian Affairs, and early action by the committee is anticipated.

Bills pending before the House Committee on Mines and Mining are as follows:

H. R. 174, by Mr. Mondell, of Wyoming. The bill provides for the reservation by the United States of the preference right to purchase radium-bearing lands on the public domain. No action has been taken by the committee on this bill.

H. R. 182, by Mr. Mondell, of Wyoming. The bill provides for a mine experiment station at Lauder, Wyo. This, along with all other bills providing for mine experiment stations, is being held in abeyance at the request of the Secretary of the Interior. Ten experiment stations have been authorized by law and arrangements have been made for an appropriation covering the establishment of three of them this year. In view of the fact that the government has embarked upon a policy of establishing mine experiment stations, it is the desire of the secretary that no separate bills providing for such stations be considered. The probabilities are that bills for the experiment stations will die in committee.

H. R. 294, by Mr. McCracken, of Idaho. This bill provides for a mine experiment station at Moscow, Idaho.

H. R. 10830, by Mr. Foster, of Illinois. This bill provides for the uniform selection and purchase of fuel to be used by the United States. It has been referred to the departments, where, it is understood, it is meeting considerable opposition. The plan is to have the Bureau of Mines adopt a scientific fuel standard and superintend the purchase of coal for government use, but this would encroach to some extent on the purchasing divisions of the departments, which is said to be the real cause of the opposition. Dr. Foster, however, has been collecting some data in regard to the haphazard manner in which fuel is being purchased by the government at present. He will push this bill regardless of the opposition from the departments.

H. R. 671, by Mr. Austin, of Texas. The bill provides for the use of the proceeds from certain mineralized public lands for the endowment of schools.

H. R. 4669, by Mr. Hawley, of Oregon. The bill provides for a mine experiment station at Grants Pass, Oreg.

H. R. 5802, by Mr. Edmonds, of Pennsylvania. The bill provides for the codification and revision of the mining laws.

H. R. 6043, by Mr. Raker, of California. The bill provides for the codification and revision of the mining laws.

H. R 12121, by Mr. Langley, of Kentucky. The bill provides for the establishment of a mine rescue station and a station for analyzing and testing coal at Jenkins, Ky.

H. R. 12884, by Mr. Carter, of Oklahoma. The bill authorizes the director of the Bureau of Mines to collect and publish statistics as to the production, manufacture and marketing of crude petroleum.

H. R. 175, by Mr. Randall, of Oklahoma. This resolution is discussed at length in another column.

H. R. 406 which authorizes the exploration for and disposition of coal, phosphates, oil, gas, potassium and sodium, was called up in the Senate April 24, but owing to objections it could not be considered by unanimous consent. There is a chance however that it may be possible to pass this bill the next day the calendar is taken up in the Senate.

H. R. 6884, by Mr. Carter, of Oklahoma. This bill relates to the payment of royalties on coal lands in the Choctaw and Chickasaw Nations. Action on this bill by the House Committee on Indian Affairs is improbable, owing to the fact that H. R. 12544 practically takes its place.

TUNGSTEN BASE OF LARGE AND SPECTACULAR PROFITS

The unprecendented demand for tungsten has resulted in such prices as to make it the source of numerous comfortable fortunes. In fact tungsten is taking a place along with gold as a basis for spectacular accummulation of profits.

One of the latest incidents of this character is that of a prospector in California, whose financial condition until very recently was not such as to call for any classification in Dun's or Bradstreet's. He was the owner, however, of a tungsten prospect adjoining the property of the Atolia Mining Company in the Randsburg district of California. Information, apparently reliable, has reached Washington that this prospector has cleared $300,000 as a result of his foresight in locating a tungsten property. When it is considered, however, that tungsten is now more valuable than silver, such profit is not so remarkable.

The metal has become so valuable as to have stimulated high grading in the properties where it is mined. An unscrupulous workman would have little difficulty in secreting about his person picked ore worth $10.00 or more it is said.

Zinc and Copper Cases Dismissed

The suit of the United States Metal Refining Co. *vs.* the United States has been dismissed by the U. S. Court of Customs Appeals. The case had to do with zinc and zinc-bearing ore and the valuation of copper ore.

GRAPHITE INDUSTRY STIMULATED GREATLY BY WAR DEMAND

"Because of its use in the manufacture of crucibles and for foundry facings graphite is a mineral resource of vital importance in time of war," according to Edson S. Bastin, the specialist of the Geological Survey in charge of this mineral. "The effect of the European war upon the graphite industry in this country during 1915 is very interesting," says Mr. Bastin, "and in general the industry was greatly stimulated by the increased demands for graphite products, particularly crucibles. Many American producers of flake graphite reported greatly increased productions. Most crucible makers greatly increased their outputs, though unable to take full advantage of the increased demands because of the difficulty in obtaining adequate supplies of graphite of crucible grade. In the mining and concentration of flake graphite particular activity was displayed in Alabama where one new plant, built in 1914, became an important producer in 1915 and where three new properties are now being opened but have not yet reached the producing stage."

Makes New Brand of Explosive

"Arctic is the name of a new brand of explosives which the Du Pont Company is now prepared to manufacture in unlimited quantities. They are truly non-freezing under the most severe winter conditions," says the Du Pont magazine. "They are quite water-resisting but should not be used in submarine work. They can be used in driving tunnels, shafts or other close work as the fumes given off on detonation are not obnoxious, and will not cause headaches. They can be furnished in all standard size cartridges. If necessary, they can be packed in bulk, in paper bags which are in turn enclosed in wooden cases. To properly detonate them nothing less in strength than a No. 6 (Red Label) detonator may be used.

"Arctic is made in five different strengths. They can be used in work such as quarry blasting, tunnels, shaft sinking, mining, subsoiling, tree planting, stump blasting, ditching by the electrical method, breaking up ice jams and many other kinds of work.

"Arctic powders contain no nitroglycerine and are therefore materially cheaper than straight or extra grades. Their velocity of detonation is even quicker than straight dynamites," says the Du Pont magazine.

Frederick G. Clapp, managing geologist of the petroleum division of the Associated Geological Engineers, has removed his headquarters from Pittsburgh to New York City, and has purchased a home in Bronxville, N. Y. The Pittsburgh office will be retained under the same management.

PROBABILITIES OF SLUMP IN COPPER SMALLER, IT IS BELIEVED

The opinion is growing in Washington that copper producers need fear no slump in prices following the definite information that peace is in sight in Europe. Each month is seeing an accumulation of more definite information with regard to the copper supply in the central countries, and, for that matter, in the allied countries as well.

It has been learned here that very extensive mining operations are in progress in German, Austrian and Servian copper mines. Despite this there is evidence that Germany is experiencing the greatest difficulty in securing adequate supplies of this metal. This is not based on the fact that copper articles throughout Germany were commandeered a year or more ago. It is believed that this was done more in anticipation of a shortage in copper rather than through any dire necessity at the time.

Reports of British analyses of shells, which fall in their lines, indicate that very soft steel is being used to some extent as a substitute for copper.

MINE OPERATORS SLOW IN MAKING STATISTICAL RETURNS

Mineral producers throughout the United States are not replying to the statistical inquiries from the Geological Survey as promptly this year as has been the case previously. There is evidence that the preliminary estimates, which were made the first of the year, are satisfying many of the producers and detracting somewhat from their interest in the completed statistics.

Attention is called by the Director, of the Geological Survey to the fact that these estimates at the first of the year and on July 1 are not expected in any way to take the place of the final statistics. He pointed out that while every effort is made to secure the most reliable figures obtainable for these reports, it is impossible to obtain the accuracy or the details within a day or two following the close of the year, or the half year period, as is contained in the completed reports.

Postal Statement

Complying with the postal law of August 24, 1912, the Mining Congress Journal submits the following information to its readers: the Journal is published monthly at 744 Munsey Building, Washington, D. C. Editor, J. F. Callbreath, business manager, J. F. Callbreath; publisher, The American Mining Congress; owners, The American Mining Congress. There are no stockholders or bondholders. (Signed) J. F. Callbreath, editor. Sworn to and subscribed before me this thirtieth day of March, 1916. P. H. Hill, Notary Public.

MINERAL RESOURCES WORK GETS AN EARLY START

By issuing the first section of its Mineral Resources report April 10 an unusually good start was obtained on this work, of the Geological Survey, giving complete data on the production for 1915. Last year the first section of this report did not appear until April 29. The first publication this year was that on Chromic Iron Ore by J. S. Diller.

STANDARDIZATION COMMITTEE TO HAVE REPORT SOON

Geo. R. Wood, Chairman of the Standardization of Equipment in Coal Mines Committee of the American Mining Congress, says his committee expects to have something shortly on standardizing of wheels, axles and bearings on mining locomotives which will be of interest to the mining fraternity.

"We have materials standardized for locomotives of thirteen tons and larger," Mr. Wood says, "and we are trying to get some common basis for small size gathering locomotives. If this can be accomplished, it will permit standardizing the above parts for all locomotives of the same weight, although made by different manufacturers."

SELLS TUNGSTEN FOR TWENTY TIMES ITS ORIGINAL COST

An incident which shows the striking increase in the price of tungsten took place recently in the Geological Survey. In 1910 one of the geologists purchased two pounds of tungsten metal simply with the idea of having some of it to show persons interested. He paid $1.30 for the two pounds which he purchased.

Having found that he had little use for this tungsten he shipped it to a buyer recently and in return for it received a check for $21.30.

NEARLY EVERY LATHE IN U. S. BUSY TURNING OUT SHELLS

Practically every machine shop in the United States has all the work it can handle, according to information reaching Washington. A considerable portion of this business is due to war orders.

An interesting feature of the manufacture of shrapnel shells is the fact that, with the development of tungsten steel, it is cheaper to turn them out of solid bars than it is to cast them. Steel is being furnished in round bars of suitable length and nearly every lathe in the country is being used to take the next step in their manufacture.

PERSONALS

J. C. McKinley, of Wheeling, W. Va., was in Washington last month, and called at the Mining Congress office in regard to the work of his committee on Uniform Mine Accounting.

Kirby Thomas stopped in Washington last month on his way South.

Carl Scholz, president of the American Mining Congress, spent several days in Washington last month on business. Miss Margaret Scholz, his daughter, accompanied him on the trip.

Dorset Carter, of McAlester, Okla., has returned to his home after spending several days in the East.

J. H. Hibben, of Parsons, Kans., was one of the party who called upon the Secretary of the Interior last month in regard to the Oklahoma coal mines.

R. R. Allen, vice-president, District 21, Southwestern Coal Operators' Association, and Frank Drew, secretary, have returned to their homes after spending several days in Washington.

Dr. L. D. Rickets, has returned to New York after a several weeks' trip in South America.

James McConnell was one of the Oklahoma operators who spent several days in Washington last month.

J. F. Callbreath, secretary of the American Mining Congress, is now in Denver, on business matters pertaining to the organization. He will be in Washington again during the early part of this month.

E. W Shaw, oil specialist with the Geological Survey, made a trip to the Tampico oil fields of Mexico last month.

A. H. Brooks, Sydney Paige, H. G. Ferguson and Fred Hunter, geologists with the Geological Survey, will participate this month in the military training camp at Fort Oglethorpe, Ga

J. S. Diller, of the Geological Survey, and Arthur L. Day, of the Carnegie Geophysical Laboratory, addressed the Geological Society of Washington, April 12 on "Lassen Peak, California."

Harry L. Day, formerly president of the Federal Mining and Smelting Co., and a director of the American Mining Congress, has started an independent smelter, at Northport, on the Columbia River, close to the boundary line between British Columbia and the State of Washington. Mr. Day also controls the Hercules, Tamarack and Chesapeake mines in the Canyon Creek district, in the Coeur d'Alene region of Idaho, near Kellog.

Charles Estemere, of Flat, Alaska, has left the interior and is on his way to Anchorage, where he expects to arrive sometime in June.

Crocoite a Rare Mineral

Crocoite, or lead chromate, is a very unusual mineral. So far as known to the United States Geological Survey, however, the material is valued only for the lead it contains and any precious metals which may be associated with the crocoite.

DENVER QUARTZ MILLS
AND DENVER STEEL CRUSHERS
have that kind of reliability that constantly and continuously keeps on being reliable.
The Denver Quartz Mill & Crusher Co.
216-17 Colorado Bldg., Denver, Colo., U.S.A.

The Equitable Powder Manufacturing Company
Alton Blasting Powder
Alton High Explosives
Black Diamond Permissibles
FUSE and CAPS
Miscellaneous Supplies
MILLS
Fort Smith, Ark., East Alton and Marion, Ill.
General Offices, East Alton, Ill.

THE MINING CONGRESS JOURNAL

LIBRARY
[illegible] 1916
UNIVERSITY OF TORONTO

SAFETY—EFFICIENCY—CONSERVATION

VOL. II

No. 6

JUNE, 1916

Photo by Harris & Ewing

F. G. COTTRELL
Chief Metallurgist Bureau of Mines

PUBLISHED BY
THE AMERICAN MINING CONGRESS
PUBLICATION OFFICE
MUNSEY BUILDING WASHINGTON, D. C.

$ 2.00 PER YEAR

20 ¢ PER COPY

WILMOT ENGINEERING CO.

Works, White Haven, Penna. HAZLETON, PENNA.

MANUFACTURERS OF

HIGH GRADE MACHINERY

FOR THE PREPARATION AND HANDLING OF

ANTHRACITE COAL

WILMOT RIVETLESS CHAINS for Conveyors for Elevators for Car Hauls — handling

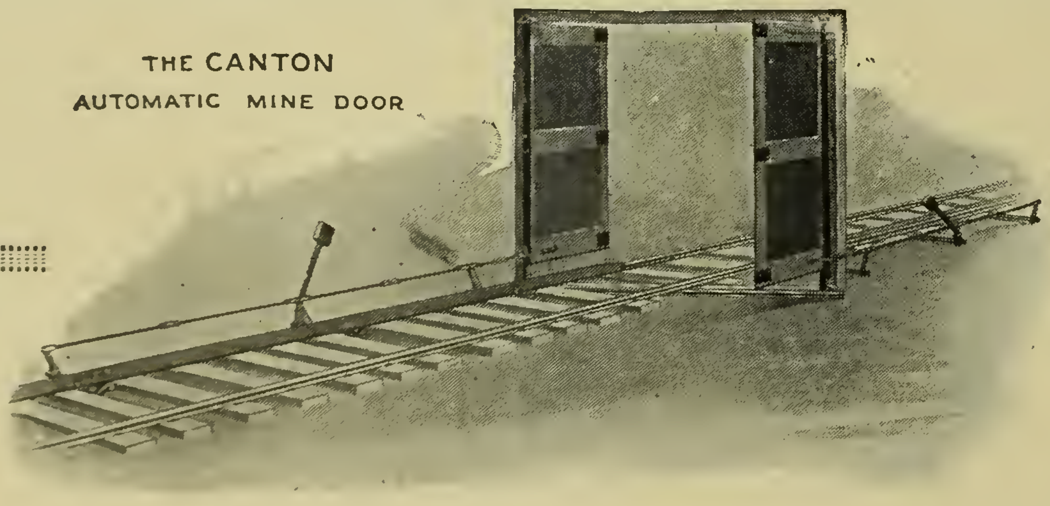
LLOYD COMPOUND (HOLLOW GROUND TOOTH) ROLLS — crushing

PARRISH Flexible Arm SHAKERS — screening

SIMPLEX JIGS — cleaning

BEST SERVICE—LONGEST LIFE—LOWEST COST OF UP-KEEP

Let us figure with you on your new installation or replacing your old and obsolete ones



IMPROVED METHODS

Without Additional Expense

IF you contend for old time methods, you might try keeping time by employing a boy with a hammer and gong, to strike off the hours as indicated by a sun dial. ¶ A trial, however, will convince you that a good clock is cheaper and more reliable. ¶ So is the Canton Automatic Mine Door better than a trapper boy. ¶ Write for literature.

THE AMERICAN MINE DOOR COMPANY, Canton, Ohio

Vol. 2, No. 6 Washington June, 1916

THE MINING CONGRESS JOURNAL

Official Organ of the American Mining Congress

MINING MEN OF COUNTRY EXPRESS OPINIONS ON FOSTER BILL

Few Seem to Like the Bill, but Lack of Constructive Criticism is Noted—Some Favor Temporary Locations—Many Want Apex Law to Go—Revision of Law Live Topic in Washington

So far as Washington is concerned the matter of revising the mining laws continues to be of the greatest interest among a large number of mining bills which are before Congress.

The majority of the members of the Committee on Mines and Mining of the House are very set in their opinion that the mining laws can be revised without the intervention of a commission.

Dr. Martin D. Foster, Chairman of the Committee, has drafted a bill which he thinks should be the foundation for the new mining code. He announces that he is not wedded to any provision of the bill, and is perfectly willing to have it amended and changed so as to increase its efficiency.

Copies of the bill have been circulated widely and a great many letters are being received from mining sections of the country commenting on and criticising the bill.

Extracts from some of the letters received by Representative Taylor, of Colorado, follow:

THINKS BILL A JOKE

John A. Ewing, Attorney-at-Law, Denver, Colo. The bill is so impossible that one does not know where to begin to criticize it I hope the Congress of the United States has better sense than to open up the entire subject anew by any bill, let alone one like the one proposed I am strongly of the opinion that, while our present mining law is far from perfect, and while it is impossible to have a perfect one, and while I am heartily in favor of any amendment which upon full consideration will be of advantage, I am always afraid of new laws on the subject for fear they are worse than the old. The great difficulty about this whole matter is that you have had a great many people, mostly mining engineers, who object to the law as it is, because they probably got "stung" sometime or other. While I am not averse to any improvement of the law that can be made, I have never been enlightened by anybody as to what would be an improvement upon our present law. I am speaking now, and confining myself to purely metalliferous mines, I will speak later of oil placers. The theory of our mining laws is that the vein is the principal thing and that that is what the prospector seeks and when I say "vein" it includes all forms of deposits which are defined in our present law There is only one other way in which mines could be acquired on the public domain and that would be by granting so much land regardless of what is in it, or the course or direction of any vein or veins, and regardless of whether or not it were substantially flat deposits which you hear of (but which I have never seen) or vertical veins which, in their downward course, go far in a horizontal way from the point nearest the surface. I could cite you hundreds of instances where the people would be dissatisfied with a law of that kind, just as you find them dissatisfied with our present law The great trouble is that nature did not place its mineral deposits in the earth in the proper manner to suit most of the parties complaining, and when you trace the complaints to their original source, I think you will find that most of them are made because nature did not fix matters to suit the parties complaining. I don't believe that there is such a general demand for an amendment to the mining laws as would appear from the reports that you send me The bill which you sent me as drawn, I regard as a joke If it were drawn by eminent mining lawyers, God help the mining lawyers, who are not eminent. I don't want you to understand or to think that I am taking a broadside shot at the proposed law, but I want to say that I have thought of it a great deal more than most people have—in fact, I have been close up against it for more than thirty years, and have had occasion to find a great many things that I would have liked to change for certain particular cases; then in a few years I have come across situations where, had the law been changed, I would have liked to change it back—and so you will find it continually. There are some rather laughable things in the Foster Bill, and it seems to have been drawn and seems to be pushed by persons who have a mania for legislation, regardless of what it consists of.

APPROVES THE BILL

S. J. De Lan, Attorney-at-Law, Glenwood Springs, Colo. I heartily approve the bill. Particularly that part allowing a temporary location; and also, the limitation of the number of mining claims that a locator can acquire. The first, because it is so very seldom that we find outcroppings on the surface of the ground; and the amended law will allow a prospector to develop for mineral if the indications in the locality appeal to his experience and judgment. I won a case in the Interior Department once, in which the contestant averred that my client had not made a discovery of ore in place by stating in my brief that, "Nature did not open its bosom to throw paying ore at the feet of the prospector;" but, he judges from indications to expend labor, time and means to make a mineral discovery. In regard to the limitation of the number of claims the locator can acquire; it is an amendment that has long been needed to keep the public domain from being acquired for speculative purposes, or moneyed men from grabbing all of the promising mining land in any given locality. Even now, in the western slope, individuals and companies are locating miles upon miles of land presumed to contain oil simply on indications without any discovery of oil, but only to monopolize the land in case developments should prove them to be valuable for oil. I have had considerable experience in mining law, and also in practical and scientific mining as the enclosed endorsements, that I have received for the position of Commissioner of Mines in 1883, shows. Had the office been created I would have received the appointment, and I think that under these circumstances my opinion relative to Mr. Foster's bill should have a modicum weight, at least.

AFRAID OF THE BILL

George E. Collins, Mining Engineer, Denver, Colo. You should not receive the impression that our committee is opposed to a revision of the mining law; on the contrary, a majority of us favor it. It is merely that all the committee, without exception, feel that H. R. 12275 is absolutely *hopeless* as the foundation for a workable and satisfactory measure. It is too complicated and too contradictory, and would not work in practice if it were passed. It is not, however, correct that mining men in this State are, or ever were, a unit in bitterly denouncing the present "obsolete laws." I should say that an overwhelming majority of mining engineers, a small majority of mine operators, and a large minority of mining lawyers, favor revision; but other people in the mining camps are generally indifferent. H. R. 12275 is a good example of the kind of legislation we were afraid of.

NO HOPE FOR POOR MAN

L. A. Pease, of Battle Creek, Colo., No law should be enacted until a competent commission shall have visited a very large share of the mining districts, some of every character, and personally get the ideas and opinions of miners and prospectors, noted and tabulated them as to their real volume and value and framed up their conclusions therefrom. The apex principle should be retained under modifications to conform to supreme court decisions, practices in locating and patenting, and to avoid overlaps and conflicts, to apply to fissure deposits. The nominated "square claim" of the new proposed enactment should be made to apply to blanket formations like Leadville, body deposits like the Morenci-Clifton and other coppers and the infiltrated deposits like some Nevada and Idaho fields. As a limit to what any person might take up, the homestead acreage (160) should govern instead of the smaller acreage proposed, and shapes as free as the homestead shapes allowed. Necessity of discovery discarded to avoid perjury practices and to be practical. The $500 improvements and purchase prices retained to secure patent. Make placer claims unforfeitable after patent except absolute fraud be shown and proven within two years after date of patent. Mark claim boundaries well, and locations have filed in U. S. Land Office of the district. Abolish tunnel site claims. Whatever you do get all you can for the prospector and ore prover. H. R. 12275, as printed, deprives the poor man of practically all the old law gives him hope for, and leaves him nothing. It also implies a determination to mine out and exhaust our mineral deposits as rapidly as possible for the benefit of such as already have financial competence.

LIKES THE BILL

J. E. Simonson, Lawyer, Denver, Colo. I am heartily in favor of the bill if I understand it right. I have lost considerable money on this apex question.

WOULD KILL BILL

William Rathmell, Secretary of the Ouray Commercial Club, Ouray, Colo. Our work has been largely an examination of the bill, and in addition we have consulted the mining men of this section relative to the effect it would have upon mining; from this we believe that the operation of the bill applied to actual mining would retard development, increase litigation and throw the mining world into a chaotic condition from which it would not recover in a decade. We feel that this bill should be killed and that anything that you can do to this end could be greatly appreciated.

LIKES PRESENT LAW

George C. Manly, Attorney and Counselor, Denver, Colo. The Press announces that Mr. Foster's bill for the investigation and codification of the mining law is now before the committee, and that many members are in favor of repealing the apex law. To my mind, this would be a grave mistake. Our mining code was framed many years ago, based upon the experience of California and Nevada miners, and it is a logical thing that the man who has the vein on the apex should be allowed to follow it throughout its entire depth, even if it departs from its side lines in its downward course. I am well aware of the fact that men who have never been practical miners, or who have never practiced law in mining communities, think that it would be much simpler to have a man's mineral rights determined exclusively by his side lines and side lines extended down vertically. The only way to discover or to work mineral deposits is to have your development and mine workings follow the ore wherever it may go. The moment you start a vertical shaft where your veins are pitching, or where you start a blind tunnel looking for a vein at great depth which was apparent upon the surface, you are in grave danger of being lost underground, also in danger of losing an ore body which has developed some change or pitch or strike, or which has been got out of place by some fault or displacement. The logical thing in practice, therefore, is to follow your ore and it is much more equitable to give it to the man who discovered it and is following it than to give some purely legal right to some adjoining property owner who will be under great disadvantage in attempting to fix the actual locus of the mineral deposits at some great depth. Moreover, the fact that Colorado and other States have amended the location law so that a greater width of claims is now obtainable, mitigates and minimizes the future occurrence of apex questions so far as future locations are concerned. The larger the territory of the claim the less likely there is to be an apex question involved. I believe that an analysis of most of the apex litigation will show that the controversies have arisen over a peculiar condition of facts rather than from any obscurity in the construction and interpretation of the law. I think that the practical situation underground in following a vein and the experience as to apex litigation, all point toward the proper retention of the present system.

THINKS APEX LAW ALL RIGHT

Murray Lee, Wheatridge, Colo. I think the stagnation in mining during the past ten years was due entirely to the financial depression existing over the entire United States and not to glaring defects in our mining laws, as many contend. The revival in the past year proves my contention. The present mining laws are the outgrowth of many years of experience and it always seemed to me they fit the ground pretty closely. I think the Foster bill in particular, and some other attempts to amend the mining laws are utterly impossible. In short this is not the time to do the work. There are too many sinister influences at work against the West. Put it off a few years until the situation clears. It is my opinion after a quiet canvas of my mining acquaintances, that the mining men of the West do not want the laws revised at this time. I would like to call your attention to an article published in *Mining Science* about April, 1913, bearing on the apex law. This author examined all the cases of mining litigation on record in the files of Robert S. Morrison, the mining attorney of Denver, with the idea of separating the strictly apex cases. It was found that out of over 5,000 cases of mining litigation occurring between the dates of the inception of mining in the West and the end of December, 1912, only 115 or 1.7 per cent of the total had their beginning in disputes arising over the apex law. We frequently hear the assertion made that 99 per cent of all mining litigation comes from the apex law, but the cold facts completely reverse the assertion.

WOULD HAMPER PROSPECTING

Fred J. McNair, Mining Engineer, Leadville, Colo. I favor temporary locations provided the prospector can be confined in his permanent location to the territory included in his temporary location with the addition of such of the public domain as may be at that time open to location. As I read the bill now he has a right to make a temporary location and after discovery he can swing his claim along the vein and lap over other temporary locations. This will have the effect of preventing prospecting anywhere within a radius of approximately half a mile of any temporary location, and is bad for the mining industry. What is the matter with cutting out the apex rights altogether? You know that they have always been a fertile source of litigation with the result that the most successful liar wins. Then there is another serious objection and that is that any new laws now passed and any such wholesale revision of the mining laws as is hereby undertaken must necessarily lead to a rehash of all the mining decisions to date so that for the next 10 or 20 years no locator will know exactly what his rights are under the law.

CONDEMNS APEX LAW

James F. Burns, of Colorado Springs, Colo. I am greatly interested in the bill which is now before Congress for the amendment of the apex law. I have run up against this law so much in my many investments in the Cripple Creek District and have spent many thousands of dollars in defending my titles, that I can appreciate the need to have very complete information to place before the committee that has the bill in charge, and in this connection it has occurred to me that it would be well for your secretary to collect full data in regard to the conditions which operated in the notable case of the Booth Reorganized Mining Company, of Goldfield, Nevada. This case did not come to trial so that I have not the necessary information in my office or I would send it to you. In a general way, I would say that the ore-bearing zone in this district is apparently somewhat in the shape of a bowl, and for the sake of illustration I would state that on the western rim of the bowl very rich ore was encountered in very deep and expensive workings on two or three different properties. This was followed down to considerable depth outside of the lines of the original claims, but still within the rights of other claims belonging to the discovering companies. About this time, the Booth Company, with two or three so far valueless claims on the northerly rim, in which no ore had been discovered nor any appreciable amount of work done, found that this rim apexed through both end lines of their property and at once commenced suit for extralateral rights which, owing to the peculiarly flat nature of the vein or contact (bowl-shaped as above stated) carried their apex claims an enormous distance in a southerly direction across the camp. These suits were in several cases compromised and in others are still pending, whereby this previously insignificant company became a very important factor in the camp and obtained large grants of stock and money from the various companies to the south of them on the theory of extralateral rights, and it is safe to say that this company is going to make still further claims along this line. I do not pretend to place this case before you exactly as it occurred, but as near as I can from the data which I have received. Owing to a lack of exploration work and possibly that the before mentioned rim of the bowl or apex of the vein does not show at the surface towards the east and south, it is not possible to be positive as to this bowl-shaped theory, but even if it is but a theoretical case, it is a perfectly possible one and may turn out to be a fact. Then the question arises in my mind, if the apex law is to be sustained, what would be the rights of holders of claims on the southerly rim who expose the apex on their properties? It is fair to assume that the same rules would govern and in that case, you are face to face with this—that the vein had two apexes; that is to say, the northerly end and the southerly end, and it may indeed be safely said that it had four apexes because there would be the westerly and the easterly apexes. In fact, if I have stated this case correctly, it shows the utter foolishness of the apex law as endeavoring to be made to apply to all varying conditions of ore deposits.

A VITAL QUESTION

William B. Phillips, President of the Colorado School of Mines, Golden, Colo. The entire West, and Colorado especially, is concerned in this matter. It is one of vital interest to the development of the mining resources of the West.

FOLLOW MEXICAN LAW

Horace E. Lunt, Mining Engineer, of Colorado Springs, Colo. It seems to me that if Congress is not willing to take expert advice on this subject, it would be much better to get either the old Mexican law, or one of the Canadian laws, and frame a bill along those lines. Dr. Foster's bill, while it abolishes the prerequisite discovery before a location can be considered valid, does not abilish extralateral rights, but on the contrary, clothes this right with new and confusing features which would undoubtedly open up a limitless field for litigation. His idea of two different sizes of claims and of the re-location of claims after discovery is made, seem to me far from clear, and I do not see how the locator would be protected from anyone else who desired to come in and locate another claim in close proximity to him before he had determined the final boundaries of this orignial location.

TOO MUCH RED TAPE

L. W. Scovel, Telluride, Colo. I must say as an old prospector, miner and mill man of nearly 40 years of practical experience, I do not approve of it in general. First, there is too much red tape about it. Second, it will retard development of our mineral resources, because it limits a person to five locations. Third, there is only about one in 500 men that has the good judgment of what will make a good paying mine even after 100 feet of development work, and it is the severest and hardest labor a man ever performed.

(Continued on page 299)

SUNDRY CIVIL BILL INCREASES APPROPRIATION FOR BUREAU OF MINES $207,705

Makes Total for Bureau Close to $1,000,000—Action Marks Recognition, Many Think, of Need of Mining Industry for More Government Aid—One Important Item Dropped—Experiment Stations Provided for

An increase of $207,705 in the appropriation for the Bureau of Mines is contained in the sundry civil bill, which was repoted to the House late last month. This rather generous treatment of the Bureau of Mines, while it is somewhat less than the estimate, is regarded by close observers as the beginning of increased appropriations for mining work, for which the Mining Congress has been working.

If all of the items are retained in the course of the bill through Congress, the Bureau of Mines will have an appropriation for the coming year of almost $1,000,000.

The appropriation committee struck from the estimate one item, which, while comparatively small, is a very necessary one. The Bureau askes for $26,055 for repairs to old mine rescue cars. Discarded Pullman cars were purchased for mine rescue work six years ago. They were not in the best condition at that time. As the cars are used almost constantly they are now in very bad shape. A number of railroads are refusing to carry them on their passenger trains as their inspectors declare that they are a source of danger. The fact that they have to be moved on freight trains seriously hampers mine rescue work. When an accident has taken place in a mine it is very necessary to get these cars to the nearest station at the earliest possible moment. It is hoped, however, that the item may be restored on the floor of the House or Senate.

The House bill carries items for the Bureau of Mines as follows: general expense, $70,000; mine accidents, $347,000; testing fuels, $135,000; mineral mining, $100,000; petroleum and natural gas, $70,000; mining experiment stations $75,000; moving Pittsburgh station, $42,700; care and maintenance new Pittsburgh building, $14,305; purchase three new mine rescue cars, $53,000; equipment three new mine rescue cars, $13,500; operating three new mine rescue cars, $35,000; mine inspector for Alaska, $3000; mine inspector for Alaska per diem, $2,500; clerk to mine inspector for Alaska, $1,500; books and publications $1,500; mine rescue car sidings, $1,000.

SURVEY GETS NO INCREASE

Practically no increases in the appropriation for the Geological Survey are contained in the Sundry Civil Bill. The bill, itself, carries $100,000 less than last year's appropriation, but this is due to the fact that this $100,000 was carried earlier as an emergency appropriation and already has been turned over to the Survey for its Alaskan work. The bill carries an appropriation of $35,000 for the Chief of Staff of the Army, which is to be turned over to the Survey to enable it to make special topographical surveys of certain areas to be selected by the War Department. In addition the Survey is to secure such additional topographical data as the War Department may request.

George Otis Smith, Director of the Geological Survey, appeared before the House Committee on Appropriations and advocated that this amount be allowed for work in the unmapped coasts and boundary line portion of the United States. There are 13,000 miles of the coasts and boundaries of the United States which are unmapped. The War Department is anxious to have a strip twenty miles wide in these areas carefully mapped. The advisory board of engineers recently called attention to this very essential step necessary to military defense. The unmapped area on the coasts and boundary lines amount to 260,000 square miles.

The War Department has indicated that priority would be given to the mapping of the entrance of Chesapeake Bay. Just as soon as the money is available the Survey will push this work energetically.

An effort was made in 1912 to secure an appropriation for this work, but at that time it was not considered favorably. With the emphasis that has been placed on the desirability of being prepared for defense there perhaps will be no opposition to the granting of this additional money.

Since 1905 there has been active cooperation between the War Department and the Survey. A great deal of confidential topographical information, which does not appear on the public maps, has been furnished the War Department since that time.

NOT GOOD POLICY TO ACCEPT A LEASING BILL, SAYS MUDD

Seeley W. Mudd discusses his views on the leasing bills as follows.

"I discussed your editorial with regard to 'Leasing Bills' in the current issue of the Mining Congress Journal, in San Francisco a day or two ago with four or five prominent mining operators there and their feeling was that it did not seem good policy to accept a leasing bill. They feel that justice is in the other direction and that the effort should be continued to get a proper revision of the mining law, but not to favor leasing. I concur in this idea."

GOVERNMENT EXPERTS WELL KNOWN TO MINING MEN

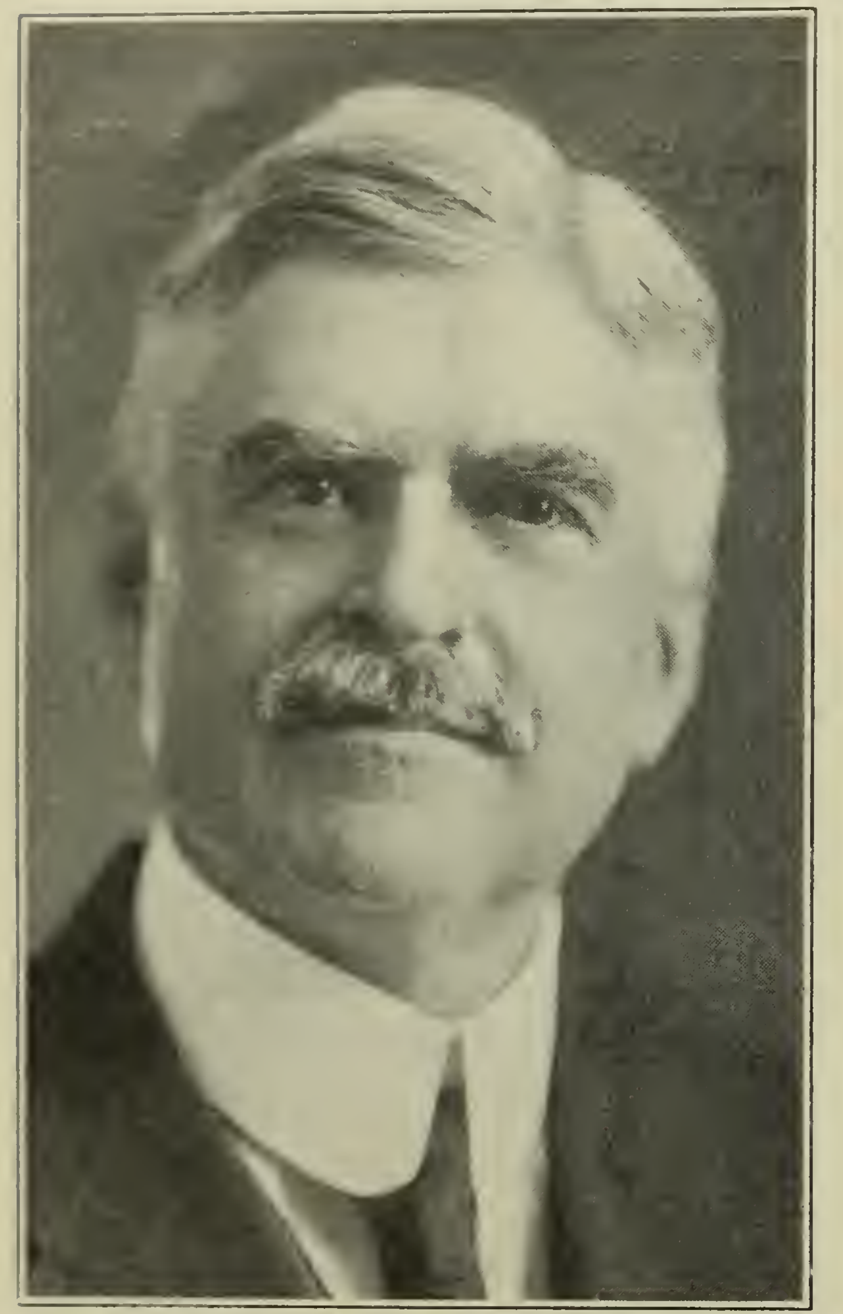


Photo by Harris & Ewing.

GEO. S. RICE,
Chief Mining Engineer, Bureau of Mines.

George S. Rice was born in Claremont, N. H. His first schooling was obtained in the private and public schools in New York City. His higher education was received at the School of Mines of the Columbia University, from which institution he was graduated in 1887. Following the completion of his studies Mr. Rice entered the service of Osgood Companies now part of the Colorado Fuel & Iron Co. He spent three years in the service of these companies and then was transferred to the allied Whitebreast Fuel Co., with which concern he spent five years at Ottumwa, Iowa. In 1897, his headquarters were transferred to Chicago and later he was also made Chief Mining Engineer and General Superintendent for the Cardiff Coal Company, and the Shoal Creek Company.

In 1900 Mr. Rice entered general consultation work. He did important work for the fertilizer department of Armour & Co. in the phosphate districts of Florida and Tennessee. He made reports on the coal properties along the Santa Fe system and other large interests, and he entered into mining operations of lead and zinc deposits of Wisconsin and of the Joplin District while engaged in private practice.

In 1908 he was selected by Dr. Joseph A. Holmes at the beginning of the Federal government's investigations to accompany him on a trip to Europe to see the European methods of preventing mine accidents and explosions for the technological branch of the Geological Survey. On this trip, England, France, Belgium and Germany were visited. In 1911 Mr. Rice conducted a party of Mining Engineers on a similar trip through Europe. One of the questions which received particular attention on this trip was the hydraulic sand filling of mine workings to obtain greater percentage of coal recovery and decrease the hazard of mine fires and explosions.

With the creation of the Bureau of Mines, Mr. Rice was made senior Engineer and later chief Mining Engineer. His specialty since then has been the investigation of mine explosions. He opened the experiment mine at Bruceton near Pittsburgh and conducted explosion experiments there on a large scale. These experiments unquestionably put the United States ahead of all other countries in this class of investigations. In 1912 under the auspices of this government he was instrumental in organizing an international Mine Experiment Station conference, the first meeting of which was held in Pittsburgh and was attended by the directors or representatives of the testing stations of Germany, Austria, France, Belgium, Russia and Great Britain. The next meeting was to have been held in London the summer of 1914 but like many other international scientific associations was abruptly stopped by war. In the course of these experiments, Mr. Rice invented certain types of barriers, for stopping or checking explosions. He is the author of a large number of bulletins issued by the Bureau of Mines and many articles which have appeared in the scientific press.

Mr. Rice is also the inventor of a portable mine safety cage. This cage is collapsible and can be carried on a railway car. It has been used to great advantage following explosion in mines. This was particularly the case in the Banner mine in Alabama.

Mr. Rice is a member of the American Institute of Mining Engineers, The (British) Institution of Mining Engineers, Engineers Society of Western Pennsylvania, American Society for Advancement of Science, and other scientific and engineering organizations, and also is a member of the widely known Cosmos Club of Washington.

SURVEY MEN URGED TO GO TO MILITARY TRAINING CAMPS

Men in the service of the United States Geological Survey are being urged to take advantage of any possible attendance at military training camps. Several Survey men are at Dodge, Ga. A. H. Brooks, geologist in charge of the Division of Alaskan Mineral Resources, has written the director from the Georgia camp, declaring that the training is most valuable to field men in the Survey service.

GOVERNMENT'S SAFETY FIRST TRAIN BEING VISITED BY 50,000 WEEKLY

Bureau of Mines Exhibit, Which Occupies an Entire Car, Attracting Particular Attention—Director Manning Accompanies Exhibit on a Portion of the Trip—All Parts of Country May Be Visited

The United States Government Safety First Special Train, consisting of twelve modern steel cars filled with exhibits illustrating the various activities of the Federal Government, left Washington, Monday, May 1, over the Baltimore and Ohio Railroad System for a tour of the cities and towns of the country.

The train is the outgrowth of the Safety First Exposition, which was held at the National Museum in February and was suggested first by the American Mining Congress. The Congress was of the opinion that the highly instructive and educational exhibits at the Museum would prove even of more interest to the citizens of the United States who were unable to visit the Nation's capital.

Van H. Manning, Director of the Bureau of Mines, was named by Secretary Lane as the executive officer in charge of the train as representing the Federal Government, with Morton F. Leopold as assistant.

The Interior Department is represented on this train by two cars. An entire car is devoted to the Bureau of Mines exhibits and is in charge of George W. Riggs, with John Morey as assistant. This car contains a complete representation of the rescue apparatus used by the Bureau of Mines.

The train has been an enthusiastic success everywhere it has appeared. The crowds are limited only to the capacity of the train to care for them. It has been estimated that not more than 1,000 persons can go through the train each hour at a reasonable speed and see the exhibits. The attendance each week is about 50,000 people. It is expected that the train will visit more than 100 towns and cities on the Baltimore and Ohio Railroad System. There are many requests from other parts of the country to see the train and certain requests from other railroads. The question of taking the train over other railroad systems will be taken up later.

A description of the principal exhibits follows:

Mine Rescue Team.—A standard rescue team is represented by five manikins. The team is completely equipped with a breathing apparatus, canary bird, pick for testing the roof, first-aid cabinet, axe, signal hooks and life line. Each figure is dressed in overalls and carries a different type of breathing apparatus. This includes the Gibbs type which recently has been developed by the Bureau of Mines.

A mine rescue telephone is shown.

One of the very noticeable features of the exhibit is a cage of canary birds. They are labeled simply "Life Savers."

Methane-Analysis Apparatus.—This is used for detecting explosive proportions of methane in the air of coal mines.

Model of a Mine Fan.—The model is so mounted that by opening and closing shutters the ventilation current can be reversed without reversing the fan or stopping it.

Safety Lamps.—A complete line of electric mine safety lamps as well as the flame safety lamps are shown.

Permissible Explosives.—The explosives which have been approved by the Bureau of Mines as suitable for use in gaseous or dusty coal mines are shown. This explosive gives a relatively short, quick flame and does not generate large volumes of poisonous gases.

Testing Dynamite.—A centrifugal apparatus for testing dynamite is displayed.

Bureau of Mine Activities.—A large map with different colored electric lights indicates the location of offices, laboratories, mine rescue cars, and mine rescue stations of the Bureau of Mines.

Other exhibits consist of:

Electric igniters, powder jack, testing gal

SAFETY FIRST TRAIN LEAVING WASHINGTON

HARRIS & EWING
WASHINGTON D.C.

SECRETARY LANE AND GROUP OF GOVERNMENT OFFICIALS VISITING SAFETY FIRST TRAIN.

vanometer, magneto firing machine, box for detonators, safety contact dry cell battery, spinthariscope, radium safety signs, radium salt, emanation tube, coal-dust inflammability apparatus, rock dust concentrated barrier, trough rock dust barrier, automatic mine door, rock dust sampling device, universal safety symbols, photographs of safety practices, motion picture reels, resistance thermometer, electric drying oven, electric furnace with automatic control, sampling apparatus, analytical chain balance and Bureau of Mines' publication.

Special attention is due the transparencies which are placed in every other window in the car containing the exhibit. These transparencies show in natural colors characteristic scenes in underground work and bring out many of the safety features in mining.

ALASKAN COAL FIELDS DESCRIBED IN REPORT FROM SECRETARY LANE

As applications for leases in the Alaskan coal fields will be received for a thirty-day period, beginning June 1, the Secretary of the Interior is about to publish a pamphlet containing all available information regarding the terms of the leases and the character of the lands to be leased.

An act of Congress in October, 1914, provided for the leasing of the Alaskan coal lands. The fields were divided into leasing units. This made necessary a great amount of field work. This was completed in the summer of 1915 in the Matanuska and Behring River fields. These are not the only coal fields in Alaska, but are by far the most important of those known.

During last winter the field records were studied and all data compiled and maps were made. It is this information which will be available within the next few days.

Part 1 of the pamphlet contains:

1. Copy of the leasing act.
2. Regulations under the act.
3. Forms of application for leasing.
4. Copy of the lease.

Part 2 contains some of the terms and all of the available information regarding the lands to be leased. It will include also an analysis of coal, measurements of coal beds, a discussion on the transportation difficulties, geology of the fields and a description of each of the leasing units.

There are sixty leasing units in the Bering River field and nineteen in the Matanuska field. These units vary in size from 240 acres to 1,200 acres. A provision is made so that adjoining leases may be combined with the maximum limit set at 2,560 acres.

Maps of each of the principal fields will show the drainage, routes of the proposed and suggested railroads, outlines of the leasing units and location of coal out-crops that have been examined.

FEDERAL PETROLEUM BUREAU IS URGED BY THE WESTERN REFINERS' ASSOCIATION

Independent Organization Believes an Appropriation of 250,000 Annually Should be Made For Extended Governmental Activity—A Billion Dollars Now Invested in Oil Producing Properties—Nearly Every State Interested

A Federal Petroleum Bureau is being urged by the Western Petroleum Refiners' Association. H. S. James, its secretary, sets forth his views in this regard as follows:

"If Congress will effectively aid the oil industry, and, in aiding the oil industry the public generally will be benefited, it will create without delay a Petroleum Bureau where matter pertaining to petroleum will be centered, in charge of thoroughly competent men, and which will disseminate accurate and comprehensive information concerning the industry, and which will gather complete statistics regarding petroleum and its products, now so urgently needed; and in connection with such a bureau the Government, if it will aid the industry, will create a chemical and mechanical research division to exploit petroleum and its products, which it is generally believed will result in the discovery of many valuable products contained in petroleum and still unknown to either scientists or manufacturers. The Standard Oil Co., by reason of its wonderful system, maintains exhaustive statistical and research departments for its own use, but no such information is at the disposal of the general public. Present petroleum statistics issued by the Government are necessarily delayed and incomplete. They do not set forth the comparative value of one year's production of crude with another year's production of crude by reason of impregnation of demanded products; and there are no statistics whatever as to the amount of products manufactured, from year to year, the amount of domestic consumption and foreign shipments, the value of these products, nor is there any available governmental information as to the number of petroleum refineries in this country, nor the character of products manufactured by them. We know of no way the Government can aid the consumers of petroleum products more effectively than by stabilizing the business through accurate publicity and extensive research, and to this end we believe the Government should make an appropriation of at least $250,000 a year to carry on this important work."

MAGNITUDE OF THE INDUSTRY

Mr. James also has compiled the following data:

The magnitude and importance of the industry are illustrated in the amount of capital invested. Authentic data are not obtainable. The most reliable information at hand shows there are 262 active and 25 idle oil refineries in the United States. Their charging capacity exceeds that daily production of crude oil. It is estimated the total investment in refineries is approximately $550,000,000, and that the investment in oil producing properties is probably $1,000,000,000. Crude oil and gas products last year were valued at approximately $300,000,000. The manufactured products of crude oil are estimated to have aggregated approximately $400,000,000. Hundreds of thousands of persons find employment in twenty-five different states in the oil industry. Nearly every State in the Union is interested, directly or indirectly, in the business. It is impossible to estimate the number of American citizens who have investments in some phase of the oil industry.

FUTURE SUPPLY

There has been much speculation as to the future supply of motor fuel. It is impossible for anybody to make a reliable prediction. It is beyond the ability of man to tell how much oil yet remains in the ground. Crude oil pools are generally found in unexpected places. The oil producing area of the United States is exceedingly small considering the territory that has never been tested. The amount of motor fuel reduced from a barrel of crude today is largely in excess of the amount refined a few years ago. When motor cars first came into use, we were using 68 to 70 gravity gasoline. Later we dropped to 64 gravity, then to 62 gravity, then to 60 gravity (speaking in terms of Baumé) and at the present time we are using 58 gravity as a basis with every indication that within the next year or two the average gravity of motor fuel will be 50 gravity Baumé. Hundreds of thousands of dollars are now being expended in efforts to develop some process by which large percentages of crude may be converted into gasoline, and as these experiments are being made the refined is discovering his ability to turn more and more of the crude product into an acceptable motor fuel. One of two things seem inevitable, either that a carburetor will be discovered that will use successfully kerosene, or that kerosene by some process will be successfully converted into gasoline. It is not so much a question of what the price of gasoline is going to be, as it is a question of of whether the supply will equal the demand. It is very doubtful if gasoline prices can recede materially under present conditions. Another Cushing pool and additional refineries might send the price downward, but any increased precipitation of gasoline or motor fuel from the present supply of crude is not expected to any more than equal the natural increase of consumption.

TOO MUCH PREJUDICE

There is too much prejudice and agitation against the oil industry. There was a time when the Standard Oil Co. so dominated the oil industry that agitation and prejudicial action only nominally affected the independent movement. Today the independent movement is of such magnitude that it is affected equally with its big competitors, in the Mid-continent region alone the independents today are manufacturing 120,000 barrels of crude per day into gasoline and other products, and this 120,000 barrels of crude per diem is the best crude procurable in the Mid-continent field, and consequently in proportion the Independents are producing more gasoline per barrel of crude than their big competitors, except for that crude which is manufactured through the Burton process. Most public statements concerning the oil industry have been untrue and hurtful. Since every man, woman and child in this country is daily dependent in some way upon the condition of the oil industry, hurtful, spiteful, prejudicial agitation is against the common weal. The independent oil men believe it is due them that a fair and accurate statement of conditions in the oil industry should be officially made at the earliest possible date based wholly upon actual conditions existing and without prejudice for or against any element in the business.

WHY GASOLINE IS HIGH

Gasoline prices have advanced, according to Mr. James, for the following reasons:

1. Because of an unparalleled consumption of gasoline.

2 Because simultaneously with the big demand for gasoline, as a result of almost one million new motor cars, came a spectacular slump of 200,000 barrels a day in the production of the highest quality crude in the world for the manufacture of gasoline, creating a scarcity of crude.

3. Because of the increase in the price of crude.

4 Because when the changed conditions came, it found all storage, both manufacturers and dealers, empty, and everybody at once started to fill.

5. Because of a deterioration in the high grade of Cushing crude from which less gasoline can be made now than when the pool was first opened.

6. Because motor cars are now equipped to run the year round, and refiners do not have an opportunity to store gasoline in winter against a big summer consumption as they formerly had.

7. Because of failure to find prolific new pools and the consequent continued high price of crude. When Cushing was at its height, 300 wells a month were drilled in the Mid-continent fields. Today there are 2,000 wells drilling in the Mid-continent field.

AMOUNT OF ZINC IN ANTIMONY SUBJECT OF AN INVESTIGATION

Criticism of the Bureau of Standards, of the Department of Commerce, by an English antimony dealer has been given some prominence by the technical press. The complainant feels much aggrieved at what he alleges to be an improper assay of the antimony supplied by his concern. The analysis by the Bureau of Standards showed the presence of zinc in the antimony in question.

The Bureau of Standards has carefully gone over its assays and maintains that zinc was present in the samples which it assayed. Of course the bureau is not vouching for the correctness of the label on the sample. There is a bare possibility that the sample may have been labelled incorrectly.

The matter is resulting, however, in an extensive analysis of the antimony to determine just how frequently zinc is present. The Geological Survey is watching the outcome with considerable interest.

The examination that caused the complaint was made by the Bureau of Standards for the Government Printing Office, which uses considerable quantities of antimony in type metal.

EARLY ESTIMATE ON COPPER COMES NEAR FINAL FIGURES

B. S. Butler, of the United States Geological Survey, in his first-of-the-year estimate of the production of copper by the smelters in the United States, came within one-tenth of one per cent of the actual figures, which just have become available. In his estimate on refined copper, he was less than one-tenth of one per cent away from the actual figures.

Information reaching the Geological Survey indicates that the domestic consumption of copper is continuing to increase very rapidly. While a great deal of this is going into the manufacture of munitions, the demand from other trades is remarkably heavy.

Advices from all parts of the country indicate that copper is sold ahead farther than ever before has been the case.

BUREAU OF MINING ECONOMICS BEING PLANNED BY AMERICAN MINING CONGRESS

Division to Be Placed under Direction of High-Grade Statistician—Data of Great Importance to Mining Industry, now Unavailable, Will Be Collected—To Be Furnished Congress and Legislatures

Upon the recommendation of a committee composed of Messrs. Hennen Jennings, Dr. James Douglas, David W. Brunton, S. A. Taylor, M. S. Kemmerer, Harry L. Day and Carl Scholz, there is now being organized a Bureau of Mining Economics, its purpose being to advise the public of the real importance of the mining industry to every other business, and to point out the needs of the industry. It is believed that if the National Congress and the State legislatures could be provided with reliable information concerning the mining industry it would enable legislators to act more intelligently and wisely when considering legislation which has to do with the mining industry.

The obligation upon the industry to provide a fair wage for its employes and proper living conditions for their families is recognized, but it is not recognized that a fair profit should also be allowed to the operator and that the products of mining should be furnished to the consumer at the least possible cost consistent with good operative methods.

Every increase in wages, every increase in the amount of compensation or damages paid for personal injuries, every effort looking to the extraction of the more expensively mined coal or ore—in order that these may be conserved for the use of the public—necessarily means an increase in the cost of production, and, under proper conditions, an increase in the selling price which the public should be made to understand.

The proposed Bureau will be in charge of a high-grade statistician, equipped with all the necessary facilities for assembling, compiling and making available for practical use all possible information concerning every phase of the mining industry. The service of the Bureau is to open to members of Congress, to members of State legislatures, and any others to whom the information might be of use and concerning which inquiry might be made. This work is to be under the direction of a committee, representing the best thought of the various branches of the mining industry, to be selected by the Directors of the American Mining Congress and the subscribers to the service.

The expense of the Bureau is to be met by subscriptions so divided that every branch of the industry may contribute its proper share in a broad, impersonal way so that the organization may speak as the representative of the whole industry, and it will consider only such matters as are of general interest and upon which there is substantial agreement among mining men.

It is proposed to furnish prompt information to all subscribers concerning proposed legislation before Congress and the several State legislatures, to provide for such publicity as will be serviceable in fostering good and discouraging bad legislation; to advise all those whose special interest in any undesirable legislation would seem likely to secure their actual opposition to its enactment and to carry on a propaganda to educate the public to a proper appreciation of the needs of the mining industry.

The details for the operation of this Bureau will be under the direction of the committee referred to, the members of which thus far selected being S. D. Warriner of Philadelphia, Frank S. Peabody of Chicago, B. F. Bush of St. Louis, and Dr. L. D. Ricketts of Arizona.

OPERATORS URGED TO SUPPORT BUREAU OF ECONOMICS

Otto Ruhl, Chairman of the Mineral Statistics Committee of the American Mining Congress, has submitted the following report:

The committee, through its chairman, inaugurated a campaign in the Joplin district favoring the establishment of a Bureau of Economics. Toward that end letters have been written to over 100 leading mining operators explaining in detail the work contemplated, especially calling to their attention the benefits they would derive locally from cooperation in the establishment of such a bureau.

This has been followed up by an arrangement with the Mining Association of the district whereby an address was given by the Secretary of the Mining Congress, Mr. J. F. Callbreath, who went into the details of this work. The committee expects with this ground-work laid, to carry on personally the work of seeing individually these operators and interesting them in the organization.

Letters have been written to the other members of this committee in Utah and Washington asking them to undertake the same character of work in their respective districts.

It is the belief of the Chairman of this committee that until the Bureau of Economics is established, any plans of the Committee on Mineral Statistics would have no funds from which they could be carried out, and for that reason they will give all of their energy and time toward forwarding the establishment of the Bureau of Economics.

The following letter has been sent to the operators in the Joplin district with a request that they cooperate in the proposed Bureau of Mining Economics:

"Suppose you were called before the Supreme Court of the United States to defend your rights and title to your mining property, would you wait till the case was called, then grab your hat and last bill of sale and appear to plead your case?

"Virtually the Joplin mine operators have done just that thing twice when they were called upon to defend their right and title to the American Market for their product. Instead of taking time to interest all their friends, and summon all their witnesses and assemble all their facts and evidence, they had to appear hurriedly and defend themselves as best they could and the results were meted out accordingly.

"Within another six months there will be created a tribunal before which you will be called to defend your rights to the profitable operation of zinc industry, that tribunal being the forthcoming tariff commission. Are you going to wait till the court summons to make out your case or do you not feel like taking time by the forelock, preparing your case carefully, marshaling the whole mining industry in its defense instead of depending wholly upon a volunteer system made up of eleventh hour activity?

"Doesn't your previous experience counsel you an organized movement, gotten under way now, at once, will not only promise greater support, better marshaling of forces, a better presentation of your case, and at a much lower cost, but also secure a much better result?

"If this appeals to your common sense judgment, will you not give sufficient time to study the plans for just this kind of action as outlined by some of the foremost mining men in the United States in the enclosed letter? It appears to me that the Joplin district operators are vitally interested in this movement and should consider the matter seriously at this time. Would you like to have your mining association become a part of this movement if found desirable and practicable by a majority of its members? If so, answer upon enclosed postal card."

USES POPULAR LANGUAGE ON TOPOGRAPHIC MAPS

Within a few days the Geological Survey will send out a topographical map showing the Delaware Water Gap. The feature of this sheet is the fact that the information on the back is in popular language, and contains much interesting information with regard to the surface and historical features. Since the Delaware Water Gap region is a well-known summer resort, much frequented by automobilists, it is considered that a large number of these maps will be used by them.

This sheet is the forerunner of others which are to be in popular language. The following paragraph gives an idea of the style in which the information with regard to the area covered by the map is written:

"At first thought it may seem impossible that water alone can cut down rock so hard as that of Kittatinny Range, but the water is only a medium of the rock cutting, the hand holding the tool, as it were, for the cutting is done by the sand, pebbles, cobbles, and even the bowlders carried by the stream, just as sand placed under a moving steel ribbon or blade cuts through the hardest rock, or as emery fed to a revolving saw cuts through the hardest steel. In the same way the churning of pebbles at the bottom of small falls cuts large, round holes ('pot holes') into the hardest rocks which, left on the sides of a gorge, show that the stream once flowed at a higher level. So the Delaware, concentrating its power on a small section of the hard conglomerate, and supplied with sand and pebbles, was able, during a great length of time, to cut a gap through the rock barrier as the land slowly rose. During this time the tributaries of the Delaware cut wide, flat valleys in the adjacent softer rocks as rapidly as the gap was cut down, and thus Kittatinny Mountain was left standing in bold relief, with a great gash cut through it.

"This gorge cutting has been going on for ages, and the gap has been getting deeper and deeper as the land has risen higher and higher. When the land stops rising the gap will no longer be cut deeper, but instead the forces of nature will gradually widen the gap, and in the distant future will wear away the mountain through which it is cut, unless another period of uplift should again renew the cutting."

The price of the Delaware Water Gap Map is 10 cents.

LEASING FOREIGN TO AMERICAN PRINCIPLES, SAYS NEVADA MAN

"The American Mining Congress should oppose the leasing bills, now before Congress;" according to D. C. McDonald, of White Pine County, Nevada. "We should feel that we live in a progressive age, and are not drifting back to the Federal customs of the Middle Ages.

"The leasing system is foreign to American traditions and principles. The Government should not withdraw from entry or location, land that would pay taxes, in the State in which it is situated.

"The mining industry is already heavily taxed, still my view based on many years observation, is that the metal mines would prefer, if it should be absolutely necessary, to pay a small Federal tax on the net proceeds, of their mines rather than submit to a leasing system, encumbered with the red tape of government regulations, that may lead to monopoly.

"The western miners are only asking what the non-mineral eastern and middle States have enjoyed without protest. They have had the privilege of developing the mineral resources of their respective states unhampered by Federal legislation.

CALIFORNIA "SAFETY BEAR" MOVEMENT MAKING HEADWAY

Reports to the Bureau of Mines from the "Safety Bear" movement in California indicate that it has attained a degree of popularity that is as gratifying as it is surprising. Owing to the interest that is being taken in this movement Chief Engineer Rice has proposed that service medals be awarded for certain periods of meritorious service.

SANITARY SURVEY OF BUTTE MINING CAMP TO BE BEGUN SOON

Bureau of Mines and Public Health Service Cooperate to Study Health Conditions in Montana Mines— Flinty Dust May be Cause of Consumption among Miners as Was Case at Joplin

Investigations of miner's consumption, which have resulted in such clearly apparent good in the Joplin district, are to be begun in the mines in the vicinity of Butte, Mont. This work will be in charge of the Bureau of Mines and the Public Health Service, as was the case in the Joplin district.

A very different problem is present at Butte than was the case at Joplin. Joplin is one of the few American mining camps in which exclusively American labor is employed. The miners in that district are not migratory in their tendencies and for the most part make their permanent homes in the district. For this reason it was very easy to ascertain just the effect of the underground work on their general health. As has been published widely, it was found that the flinty dust of the Joplin mines was having a very serious effect on the lungs of the miners and was largely responsible for a high percentage of the consumption cases in this camp.

In the Butte district the same flinty dust exists but the mining population is much more transitory and it is not known at present whether the deaths from consumption in this region have been above the average. An effort is to be made to trace as many as possible of the men who have drifted away from Butte to ascertain if their health was impaired while engaged in work at the Montana camp.

In an investigation of this kind the Bureau of Mines has found considerable opposition to be overcome on the part of the workers in the mines and oftentimes on the part of their employers. When the investigation was started at Joplin it was ridiculed locally, but the investigation was so conclusive that the attitude of every one concerned changed completely. Now the miners have been convinced of the necessity of keeping down the dust and are using a spray and water injection drills, with the result that very decided improvements in health conditions has been noted.

The work in the Joplin region was conducted by Edward Higgins, a mining engineer in the service of the Bureau of Mines, and Dr. A. J. Lanza, of the Public Health Service. Dr. Lanza will continue the work in the Butte district, but as Mr. Higgins has been transferred to California it will be impossible for him to continue to represent the Bureau of Mines in the investigation in Montana. Dr. Daniel Harrington, a mining engineer of Denver, will undertake the work with Dr. Lanza. Dr. Harrington is the district engineer of the Bureau of Mines in the Rocky Mountain district.

AMERICAN GRAPHITE DEALERS HURT BY BRITISH ORDER

The British guarantee policy acts as a virtual prohibition against the exportation of graphite or graphite products, whatsoever the source of the graphite, to neutral countries by firms who handle even small amounts of Ceylon graphite, in the opinion of Dr. E. S. Bastin of the U. S. Geological Survey. As several large American dealers handle graphite from many sources it has seriously affected their established trade with neutral countries. The difficulty is perhaps unavoidable since it is difficult to determine whether the graphite in a manufactured product came from Ceylon or some other source. As most American manufacturers of graphite products have been taxed to their full capacity to meet the demands of the domestic trade and of the Allies, the restriction has not been as serious as might be supposed.

Many crucible makers are far behind in filling their orders because of the difficulty in obtaining sufficient graphite of crucible grade. Their difficulties have been further increased by the cutting off of the supply of clay from Klingenburg, Bavaria, which was used as a binder in graphite crucibles and was used also, in pencil manufacture. None of this clay was imported in 1915 and the accumulated reserves are now practically exhausted. American crucible makers have conducted extensive tests to determine the suitability of certain American clays as substitutes and in many cases have husbanded their supplies of Klingenburg clay by mixing domestic clay with it. On the whole, the results obtained with the American clays have been fairly satisfactory and it is to be hoped that when manufacturers have become familiar with the mixing and blending of the domestic clays a product will be produced that will be fully as satisfactory as that obtained with the Klingenburg clay.

GOVERNMENT EXPERTS WELL KNOWN TO MINING MEN

Photo by Harris & Ewing.

DR. C. L. PARSONS,

Chief of the Division of Mineral Technology, Bureau of Mines.

Charles L. Parsons was born at New Marlboro, Mass. He was raised at Hawkinsville, Ga., however, where he began his education in the public schools. With the completion of the common school course he was sent to Cushing Academy at Ashburnham, Mass., where he took a preparatory course for entrance to Cornell. He began his work at Cornell in 1885 and was graduated in 1888, with a degree of B.S. Later he received a degree of Doctor of Science from the University of Maine and degree of Doctor of Chemistry from the University of Pittsburgh. The latter two degrees are honorary.

Following his graduation he began teaching chemistry at New Hampshire College. Later he became the head of the department of chemistry at that institution where he was engaged from 1892 until 1911. In the latter year he came to the Bureau of Mines to take charge of the Division of Mineral Technology. Since 1907 Dr. Parsons has been Secretary to the American Chemical Society.

Dr. Parsons is most widely known for his radium work. He conceived the idea of the investigation, secured the funds for it, and has been in full charge of it since its inception in 1913. He has charge of the investigation work at the Denver office of the Bureau of Mines and also has charge of the chemistry work at the Pittsburgh office of the Bureau of Mines. In addition to his duties here Dr. Parsons is also directing the non-ferrous research in progress at the Cornell University station and the cooperating work which is being done with the University of Ohio.

Dr. Parsons has held the office of president of the Northeastern Section of the American Chemical Society, was elected by popular vote councilor at large to represent some 3,000 chemists in the Council of the General Society. He was elected one of the editors of the *Journal of the American Chemical Society.* He began to publish the results of his research from the earliest days of his connection with the department, and upon varied topics. His work on the rare element beryllium and upon its compounds is perhaps the best known, and he has published a reference book on the subject under the title "Beryllium: Its Chemistry and Literature." In 1895 he published, in collaboration with Prof. A. J. Moses of Columbia University, a text-book on "Crystallography, Mineralogy and Blowpipe Analysis," which is used more extensively in American colleges and universities than is any other text-book on the subject. In 1905 he was awarded the Nichols Gold Medal for his researches on beryllium.

HILL VISITS BARIUM MINES NEAR SWEETWATER, TENN.

J. M. Hill, of the Geological Survey, has returned from a trip through Illinois, Kentucky and Tennessee, collecting data with regard to barium chemicals.

He visited the plants of the Durex Chemical Company at Sweetwater, Tenn.; Clinchfield Products Company, Johnson City, Tenn., and the Rollin Chemical Company, at Charleston, W. Va.

All of these companies are making barium chemicals and report a good market for all their products.

Mr. Hill also visited some of the barium mines in the vicinity of Sweetwater.

During his trip Mr. Hill looked up a number of those who are delinquent in their statistical returns on coal, fluorspar, silica and pottery productions.

ZINC SMELTERS SOLD UP FOR THE NEXT QUARTER

According to the best thought available in Washington there are no evidences of important changes in zinc prices in the near future unless there should be definite steps taken by the European belligerents towards peace. Information reaching the Geological Survey is that the zinc smelters are sold up for the next quarter.

PROPERTY WORTH $5,000,000 INVOLVED IN DECISION IN FREED COAL LAND CASE

Great Interest in Utah in Recent Ruling of Interior Department—New Sulphuric Acid Plant of American Smelting and Refining Company and Utah Copper Company to Begin Operation August 1

By A. G. Mackenzie.

Salt Lake City, May 20.—The recent decision of the Interior Department regarding disputed title to 4,160 acres of coal land in the Carbon-Emery field of Utah, confirming the title in favor of Claude W., Lester D., and Ellis C. Freed, sons of the late C. M. Freed of Salt Lake City, is of interest on account of the value of the property involved as well as the circumstances that entered the case.

Local estimates place the value of the land at approximately five million dollars. The original entries were made in January, 1906, when C. M. Freed, a prominent business man of Salt Lake City, with members of his family and several employes, ten in all, filed applications to purchase 160 acres each of the land, for which the Government price at that time was $10 an acre. In the same month sixteen other applications for contiguous land were filed, the whole constituting a compact body of 4,160 acres.

The sixteen additional entrymen obtained the purchase money from Walter G. Filer, a son-in-law of C. M. Freed, each entryman giving Filer a mortgage on the land as security for the loan.

At the time the twenty-six entries were made the Government's purchase price for the entire tract was $40,800, and the Government's selling valuation on the same land at the present time is $296,240.

About six months after the entries were made the sixteen additional entrymen sold their land to C. M. Freed, who then paid off the Filer mortgages.

Messrs. Freed and Filer, their agent and their attorney, were indicted in January, 1907, by the federal grand jury on charges of conspiracy to defraud the Government. The cases were dismissed November 10, 1909, on motion of the Government, one reason for the motion to dismiss being that the Government had a complete remedy for the recovery of the land in civil procedure.

Civil suit to cancel the twenty-six entries charging that a conspiracy had been entered to acquire title to the land by the use of "dummy entrymen" was begun in March, 1910. C. M. Freed died soon after the action was begun and his interests passed to his sons. Voluminous testimony in the case was taken in proceedings that lasted several months. The local land office decided in favor of the Freeds July 3, 1911. The Government appealed to the Commissioner of the General Land Office, who reversed the decision of the local land office May 18, 1912. The Freeds in turn appealed to the Department of the Interior, which heard the case October 28, 1913, and rendered its decision a few weeks ago, confirming the title in the Freed brothers, who announce that they are arranging to develop the land as soon as possible.

WANT PROFESSIONAL PAPER

The Utah Chapter of the American Mining Congress initiated a movement in April to obtain a professional paper by the U. S. Geological Survey covering the Big Cottonwood, Little Cottonwood and American Fork mining area in Utah. A petition, which had been signed by more than 1,000 interested citizens and is still in circulation, was prepared by the chapter in connection with the movement.

The petition contains an interesting summary of the 1915 mining operations in the area mentioned, data for which were obtained from original sources by the office of the chapter. Although this area was one of the first to have the attention of miners in Utah, it had been the scene of only minor operations until the last few years when several important producers and a large number of promising prospects were developed. The territory was the subject of a reconnaissance by B. S. Butler and G. F. Loughlin of the Survey, issued recently with notes by Victor C. Heikes, as Bulletin 620-I. The unusually complex formation in the territory and the constantly increasing activity, however, make it desirable, in the opinion of the Utah mining men, to have more detailed study by the survey for the best direction of mining work.

The chapter has already been assured that the desired investigation has been given first place on the geologic schedule of the survey for field work in Utah, and it is hoped that the work can be started this year. The movement has been heartily endorsed by leading commercial organizations of Utah as well as by the mining interests.

NEW ACID PLANT

Construction of the sulphuric acid plant of the American Smelting and Refining Company and Utah Copper Company interests at Garfield, Utah, is well under way and it is expected to have the first unit in operation August 1 with a capacity of 100 tons a day.

The project will be handled by a company known as the Garfield Chemical Manufacturing Company, capitalized at $500,000, with Charles W. Whitley as president; Charles M. MacNeil, first vice-president; Robert C. Gemmell, second vice-president; J. M. Bidwell, secretary, and treasurer; Edgar L. Newhouse, Jr., manager.

EXPECT TO RECOVER POTASH

The Diamond Match Company is erecting a plant in Tooele County, Utah, for the production of potash from the water of the Great Salt Lake. The company began experiments a year ago which resulted in a satisfactory process. The first unit of the plant is expected to be ready for operations about July 1. The product will be shipped to various plants of the company, as it is not proposed at present to erect a match factory in Utah. J. H. Reeve, of Oswego, N. Y., is manager of the plant, and C. B. Smith, of Oswego, is head of the laboratories.

COAL OPERATORS CONFER WITH FEDERAL TRADE COMMISSIONER

Preliminary to the proposed investigation of the bituminous coal mining industry, at the suggestion of the Federal Trade Commission, a meeting of the coal operators of Illinois and Indiana was called by F. S. Peabody, of Chicago, to meet at his office May 15.

The meeting was attended by a large representation of coal operators of the States of Illinois and Indiana.

Vice-Chairman Hurley, of the Commission, first addressed the meeting, outlining what the Commission desires to do and his particular belief that a uniform system of cost accounting is necessary to the proper understanding of the needs of the industry. Mr. Hurley stated that the recent blank inquiry sent out to coal operators throughout the central states had secured very few responses, and urged upon those present the necessity of making reports promptly in order that the Commission get an understanding of the needs of the industry. Mr. Hurley expressed his sympathy for the conditions as he understands them and emphasized the absolute necessity for a full showing in order that the Commission may be able to act intelligently in either extending present relief or if this is not found to be authorized, then in recommending such legislation as will make possible a better conduct of the coal mining business.

Walter S. Bogle was introduced by Chairman Peabody as a banker who amused himself in coal mining. Mr. Bogle presented the facts with relation to the borrowing power of the coal industry, intimating that good banking methods prohibited any large accommodation to operators of coal mines except to those whose right to credit was based upon personal responsibility or connection with some other better approved business.

Carl Scholz, president of the American Mining Congress, discussed the necessity of cooperation between coal operators and discussed the Cartel system of Germany, which he had investigated as a representative of the United States Bureau of Mines, and pointed out the absolute necessity of better cooperation among coal operators in order that the business might be put upon a proper basis.

Rush C. Butler called attention to an Australian case recently passed upon by the Privy Council of England, which is England's highest Court of Appeals from the Colonies, in which it was held that a combination of colliery proprietors to raise the price of coal was not a violation of the Anti-Trust Laws, and that "to prove the intent to injure the public by raising the prices that intent to charge excessive or unreasonable prices must be apparent." In view of the fact that the laws, under which this decision was rendered, are very similar to the Sherman Anti-Trust Law, the opinion was expressed that a combination formed for the purpose of securing a reasonable price could not be considered a violation of the Anti-Trust Laws. However, Mr. Butler expressed his belief that there should be a modification of the existing statutes in order that there may be no question as to the right of such cooperative action as will put the bituminous coal mining industry upon a profit-paying basis.

In this connection it might not be amiss to call attention to a particular feature of the bill approved by a conference of coal operators in Chicago during the early days of the propaganda looking toward the creation of a Federal Trade Commission. After several conferences a bill was approved containing the following provisions:

> That it shall be the duty and jurisdiction of the Commission to inquire into and investigate any and all agreements relating to interstate business, and to determine whether any such agreement is in violation of the Act "to protect trade and commerce against unlawful restraints and monopolies," and whether any such contract is an unlawful restraint or monopoly. That any person engaged or desiring to engage in any business enterprise, may submit his plans to the commission for its approval, and if approved, such determination shall be final and conclusive as to all questions of fact, and conclusive that such business enterprise agreement is not in violation of the act, and is now an unlawful restraint of trade. Upon the finding by the commission that any agreement is unlawful the commission shall serve notice on such corporation that such agreement is unlawful and that all or any acts or things being done shall cease and terminate and on failure to cease all acts the commission shall certify its findings to the Attorney General of the United States. If five or more persons, citizens of the United States, whose interests are affected, complain that any corporation is violating the provisions of the Act thereon the commission shall cause summons to show cause why the commission should not declare such agreement unlawful.

TOTAL U. S. PRODUCTION OF POTASH IN 1915 SUPPLIES ONLY A WEEK'S DEMAND

W. C. Phalen, in Paper Before National Conservation Congress, Analyzes Situation —Still Hope for Discovery of Important Potash Beds in the United States, He Asserts—Kelps Not Overlooked

The last word in regard to potash salts is contained in the following paper by W. C. Phalen of the United States Geological Survey, which he read before the meeting of the National Conservation Congress, which was held in Washington, May 2, 3, and 4.

Since the search for potash is centering attention on a large number of geologists and chemists in the United States any information with regard to this mineral is eagerly sought after. Mr. Phalen is acknowledged as one of the best posted men on potash in this country.

His paper is as follows:

There were produced in the United States in 1915 potash salts valued at $342,000. Though this figure is of interest as a small beginning in the domestic potash salts industry, it is practically of no importance when the total needs of the country are considered, since it represents a tonnage consumed in less than a week under normal conditions.

Imports of refined potash salts were 76,141 long tons, or slightly more than 25 per cent of what they were in 1913, the latest normal year of potash salts importation. Imports of the potash fertilizers, kainite, manure salts, and double manure salts, were 20,427 long tons, or approximately 3 per cent of those in 1913. Taking all the potash salts together, the imports in 1915 were about one-tenth of those which have recently come in under normal conditions.

The price of potash salts has increased greatly since the domestic scarcity began to be felt. From a normal price of $35 to $40 per ton for high grade agricultural salts, prices have advanced until in the spring of 1916 chloride and sulphate were quoted at ten times the above figures and at times even higher. In April, 1916 chloride was nominally quoted at about $425 per ton and sulphate from $350 to $400 per ton.

SOURCES OF PRODUCTION

Within the United States, potash was recovered as a by-product from the manufacture of Portland cement at Riverside, Cal. By-product potash from this source has yielded not only revenue, owing to the abnormally high prices for potash salts, but in obtaining it two other purposes have been subserved, namely: (1) the saving of additional material to be converted into cement, and (2) the elimination of the dust nuisance. At Riverside, Cal., a discharge of 100 tons of dust per day over the surrounding orange groves has been prevented.

Potassium sulphate from alunite was first placed on the market late in October, 1915, by the Mineral Products Corporation, at Marysvale, Utah. The production has not been very large, owing to the incidents connected with a pioneer enterprise of this character. Though certain foreign deposits of alunite have been worked for potash alum, this is the first recorded production of potash salts as such from alunite. The product is of very high grade. The alunite deposits of Utah are the only important deposits known and, on account of their limited extent, they cannot be depended on to furnish more than a small part of the normal potash requirements of the country.

The plant of the Potash Products Company, of Omaha, Nebr., was was established in the spring of 1915 at Hoffland, near Alliance, in the northwestern part of the State. The company obtained potash salts from the water of an alkaline lake in this region. A production was

Photo by Harris & Ewing

W. C. PHALEN.

Authority on potash—a personal sketch of Mr. Phalen follows his paper.

reported from this locality during about half of the year.

In addition to a production from the above sources, some potash was marketed in 1915 from kelp, obtained along the Pacific Coast. This, however, is to be considered of organic and not of mineral origin.

FUTURE SOURCES OF PRODUCTION

Under the stimulus of extraordinary prices, experimental work on the production of potash salts from different sources was active during the past year and in places this experimental activity has passed into actual construction of works for the production of potash salts. Operations are in progress for the production of potash salts at Searles Lake and at Keeler, on the shores of Owens Lake, Cal. Near Great Salt Lake, it is reported that one company is erecting a plant and that another may be started at the south end of the lake. The by-product bittern at certain solar evaporation plants on San Francisco Bay has also received some attention.

Another plant has been planned for the extraction of potash salts and alumina from alunite at Marysvale, Utah.

Portland cement manufacturers, having had their attention directed to a possible revenue from by-product potash, will not be slow in thoroughly investigating their raw material. The Security Cement and Lime Company, near Hagerstown, Md., is reported already to be installing a plant for the recovery of potash salts, and similar installations are reported to be under way at Duluth, Minn., and Buffalo, N. Y.

Great activity has been manifested in the experiments on the silicate rocks, such as feldspar, leucite, sericite, and marl. The expense involved in obtaining potash salts from those sources, together with the uncertainties with which manufacturers will be confronted and the keen German competition, which must be met at the close of the war in Europe, are potent factors in discouraging any considerable enterprise. Without much doubt, a small quantity of potash salts was produced from these silicate rocks during the past year, which found its way into mixed fertilizers without intermediate refinement.

In the meantime, explorations have been in progress in the known salt fields of the United States with the object of revealing undiscovered deposits of potash salts that may exist in association with common salt. Particular attention is now being directed to the immense but little-prospected basin containing salt in the "Red Beds" formations of northwest Texas and adjacent parts of New Mexico, Oklahoma, and Kansas. These formations correspond in certain respects with the potash-bearing strata of Germany. They bear evidence of similar conditions of desiccation during their formation with resultant deposition of great beds of rock salt and gypsum. They are also of approximately the same period of formation as the German salts.

The northwest Texas region is a huge structural basin, about which relatively little is known of the included salt deposits, except the important fact of their existence. This region, therefore, offers an attractive field for search.

There are still possibilities for the discovery of potash in association with other important salt deposits of the country. Potash salts are inconspicuous, especially if they occur in mixtures with other salts, as they have no very pronounced distinguishing characteristics. They may very likely have been overlooked in many of the drill operations for oil and salt that may have been done in the past. For this reason, there still remains hope of the discovery of important sources of potash salts, even within the better known salt districts of the country..

KELPS AS POTASH SOURCE

One of the sources of a domestic supply of potash is the giant kelps on the Pacific Coast. These huge sea plants contains potassium chloride up to 25 or 30 per cent of their dry weight. The kelps grow in large beds which are found all along the Pacific Coast, from Lower California to the Alaskan Peninsula. The plants renew themselves rapidly after harvesting and on the southern beds two cuttings a year may be made.

Practically all of these beds are within the three-mile limit and jurisdiction over them is in the hands of the States of California, Oregon, and Washington, and in the hands of the Federal Government so far as the Alaskan beds are concerned. The survey of these beds made in 1913 by the Bureau of Soils showed approximately 390 square miles of kelp. Processes have been devised for harvesting the kelp and extracting the salts which give promise of being commercially profitable. Several large concerns have erected plants for the extraction of potash from kelp and shipments of the salts are now being made.

Legislation by the States is needed which will not only protect the kelp beds from reckless and destructive cutting, but which will provide regulations under which the private operator will be protected in his right to the kelp in the neighborhood of his plant.

RESOLUTIONS ADOPTED

At a meeting of the subcommittee on phosphate rock and potash salts of the committee on water power, nitrates, and phosphate rock, of the National Conservation Congress, held Monday afternoon, May 1, 1916, the following resolutions were adopted:

Whereas, Because of inadequate legislation the enormous deposits of phosphate rock in the public land States are at present unavailable for development,

Therefore be it resolved, That Congress be urged to enact legislation to open these deposits under provisions protecting the consumer from undue costs and assuring capital reasonable profit under definite conditions that will invite their development.

That whereas, Owing to the great scarcity of potash salts in the United States and consequent great demand and high prices of these salts for chemical and especially for agricultural purposes,

Therefore be it resolved, That all appropriate Governmental agencies be urged to use all practicable means to encourage and assist in the discovery and development of adequate and lasting sources of potash salts, and

Be it further resolved, That it is for the public welfare that all persons interested in the increase of agricultural production and prosperity in this country shall by every educational method encourage the greater nourishment of the soil through the more extended use of phosphate rock and potash fertilizer.

TAUGHT IN NEW MEXICO

W. C. Phalen has Worked in Many States in the Course of His Investigations.

W. C. Phalen was born in Gloucester, Mass. He was educated in the public schools of that city and graduated from its high school. He took his S.B. degree at the Massachusetts Institute of Technology in 1899. He also won his S.M. degree from the same institution in 1902. After coming to Washington, Mr. Phalen secured his Ph.D. degree from George Washington University.

Following the completion of his schooling, Mr. Phalen taught chemistry and geology for two years at the New Mexico School of Mines at Socorro. Afterwards he did post-graduate work at Boston Tech, and then accepted a position in the Geological Department of the National Museum.

After two years in Washington with the Museum, Mr. Phalen joined the force of the United States Geological Survey, in 1904, as geological aide. His present work has been done in the following fields: Clearfield, Johnstown, and Windber coal districts of Pennsylvania; the coal and clay districts of northeastern Kentucky; the Bauxite district of Georgia, Alabama, Tennessee and other States; salt deposits in every State in which they occur; sulphur and pyrite fields of Louisiana, Texas, New York, Virginia and other States; phosphate deposits of Kentucky and Tennessee. Mr. Phalen has also kept in very close touch with the potash situation. During the recent meeting of the National Conservation Congress, Mr. Phalen was chairman of the sub-committee on Phosphate Rocks and Potash Salts.

GOVERNMENT EXPERTS WELL KNOWN TO MINING MEN

(See cut on front cover.)

F. G. Cottrell was born in Oakland, Cal., January 10, 1877. His elementary education was obtained at Norton School in Oakland. Later he attended the Oakland High School. The next step in his education was obtained at the University of California where he was graduated in 1896 with a degree of B. S. The following year he took a LeConte fellowship at the above university.

From 1897 to 1900 Mr. Cottrell taught chemistry at the Oakland High School. He then went abroad for special study during which time he worked in the laboratory of J. H. Vanthoff in Berlin and in the laboratory of William Ostwold at Leipsig, where he obtained his Ph.D. degree. After leaving Germany he spent some time in the laboratory of Prof. J. J. Thomson at Cambridge, England.

On returning to America, Mr. Cottrell studied at Harvard and at the Boston Institute of Technology, after which he returned to the University of California as instructor in Physical Chemistry. He continued a member of the faculty of this university until 1911, when he joined the staff of the Bureau of Mines as consulting chemical engineer. Later he became physical chemist and then chief chemist. The first of the present year Mr. Cottrell was put in charge of the new division of Metallurgy of the Bureau of Mines with the title of chief metallurgist. Dr. Cottrell is known best for his system of electrical precipitation, which is playing an important part in the abatement of smoke, fume and dust nuisances.

Dr. Cottrell is also the inventor of an electrical process for the dehydration of crude petroleum. Since Dr. Cottrell had so successfully accomplished the precipitation of suspended solids in gases by means of high potential electricity he naturally was much interested in the question of the applicability of the same methods to the precipitation of water in a petroleum emulsion. So successful were his experiments in this connection that they led to the installation of a plant for the dehydration of crude petroleum on the property of the Lucile Oil Company on the Coalinga field. This plant was established in 1909 and has been in continuous operation ever since. It reduces a 14 per cent water content to less than 2 per cent with commercial success. The process has also been installed in various other plants and is being used very successfully.

CRYOLITE MINED COMMERCIALLY ONLY IN GREENLAND

Cryolite has been found in commercial quantities only at Ivigut, an Eskimo hamlet on the southern coast of Greenland in latitude 60° N. Rocks containing cryolite have been found near Pikes Peak, Colo., but not in paying quantities. The cryolite deposit at Ivigut is reported to be a solid mass having surface dimensions of about 200 feet by 600 feet, and it has been worked as an open cut to a depth of about 150 feet. The deposit widens with depth, and the depth is unknown. It is quarried by the Kryolith-Mine og Handelsselskab (the Cryolite Mining & Trading Co., Ltd.), under a state concession. In close connection with this company is the factory Oresund in Copenhagen, which has been given the technical use of this valuable mineral. During the last two years (1913 and 1914) 5,000 to 6,000 cubic meters (6,500 to 7,800 cubic yards) of cryolite have been quarried. The exports of cleaned cryolite in 1913 were valued at $700,000.

GOVERNMENT EXPERTS WELL KNOWN TO MINING MEN

Photo by Harris & Ewing.

A. C. SPENCER,
Geologist.

A. C. Spencer was born in Carmel, N. Y. He received his early education at the Brooks Military Academy at Cleveland, Ohio. Later he attended the Case School of Applied Sciences also at Cleveland. He then went to Johns Hopkins University at Baltimore and received his Doctor's degree in 1896.

Before completing his schooling, however, he spent two years with the Geological Survey of Iowa. During this time he worked on the geology of coal in that State. On returning to Baltimore he did some coal work for the Maryland Geological Survey.

He began his work with the United States Geological Survey in 1896 as assistant geologist and has given his time exclusively to survey work since.

With Whitman Cross he made a study of the San Juan District of Colorado. Mr. Spencer is well known in Alaska as a result of his study of the Copper River District as well as work done in the Juneau District. With J. C. Schrader he wrote the first discussion of the Bonanza Copper that Mr. Spencer came within two weeks of being deposit. An interesting incident of this trip was the original discoverer of this remarkable copper property.

The study of the iron and copper deposits of Cuba was made by Mr. Spencer in connection with Hayes and Vaughan.

Others of the more important studies made by Mr. Spencer are: The Encampment Copper District in Wyoming; Zinc Deposits in the Franklin Furnace District of New Jersey; Triassic Iron Ores of Pennsylvania; Copper Deposits of Ely, Nev.; Copper Deposits of Santa Rita, N. Mex. In addition, Mr. Spencer was engaged for two years in making a report on forest lands in the Appalachian region.

Mr. Spencer took the first civil service examination for Geological Survey. The present director, George Otis Smith, and the head of the section of Western Areal Geology, F. L. Ransome, also took this examination.

SURVEY KEEPS CLOSE WATCH ON MINERAL DEVELOPMENT

An instance of the keenness with which the Geological Survey is watching mineral development in the United States is shown in the following letter from Director Smith, which was written to an oil operator in Oklahoma:

"A newspaper article stating that you contemplate drilling a test for oil and gas in —— has just come to my attention. You are prospecting in a very interesting region and one about which it is desirable to secure all possible information. For this reason, I desire to urge upon you the desirability of having your drillers keep a careful detailed record of the formations encountered. It is also desirable to have their record checked by occasional samples taken from the well.

"An example of the value of this additional check came to my attention a few days ago. A driller reported a sand with a show of oil at a certain depth in a well in southwestern Oklahoma. This report might have been sufficient to encourage the drilling of a second test in case the first one failed to find gas or oil in appreciable quantities. An examination of the sample which the driller sent in, however, disclosed the fact that he did not have a sand, but a very hard, shaly formation, and that the small black particles which he had taken for bitumen or asphalt were in reality coal.

"Under separate cover, I am sending a few well record books which your drillers may find convenient. I shall also be glad to obtain samples from your wells, particularly of any oil or gas sand which may be encountered, and will be glad to send sample bags properly addressed and franked so that they may be sent through the mail without postage.

"I am very much interested in the development of north-central Oklahoma. It appears to be a region of very great promise, and at the same time one which has been but slightly exploited. I shall be glad to give you any assistance which the restrictions imposed upon this survey will permit.

URGES MINING MEN TO BEGIN THRESHING OUT DETAILS OF LAW REVISION

Revision of Mining Laws Committee of American Mining Congress Reports on Proposed Changes—Interest in Subject Is Steadily Growing, Report Says—Wickersham's Opposition Called Causeless

In view of the interest being maintained in the mining law revision, unusual interest is certain to be taken in the report of E. B. Kirby, Chairman of the Revision of Mineral Land Laws Committee of the American Mining Congress.

The report of the Committee is as follows:

The movement inaugurated by the American Mining Congress to secure a general revision of the mineral land laws of the United States and Alaska has been steadily growing in interest and support. All the organizations which represent the mining industry are now actively cooperating in the effort to obtain this revision. Theoretical discussion has been going on for a generation and what changed this into an active movement was a practical plan of action which has made an unusual appeal to the common sense of mining men and legislators.

This was the idea that a work so technical and important as the revision of the mining code should be based upon the practical experience and judgment of those who are actually engaged in the industry. If their wisdom could be assembled and condensed for the use of Congress by a Commission composed of men whose competence was known to the industry and this Commission should hold public hearings for the purpose throughout the mining regions of the West and Alaska, then mining men could feel assured of a satisfactory result.

The American Mining Congress, the American Institute of Mining Engineers, the Mining and Metallurgical Society of America, together with numerous local societies and organizations, united their efforts to secure such a Commission. A bill for the purpose was approved by the Administration and nearly passed the last Congress, but adjournment came before final action. With the present Congress there was every assurance of success and the friends of the measure proceeded to press for its consideration. As before, the Administration and the Senate approved the measure, the only obstacle in sight being indifference in the House. This was being overcome when the unexpected and causeless opposition of Delegate Wickersham, of Alaska, succeeded in blocking the bill for the present session.

In the face of this disappointment and the necessity of waiting another year for the new Congress, the leaders of the three principal organizations mentioned considered the question of what it was best to do. Various members of Congress who were unable to see why a mining code satisfactory to everybody, could not be written out by anyone overnight, renewed friendly suggestions that the societies interested should frame a bill covering the specific reforms desired and submit it to Congress like any other measure.

The mining men who have been actively pushing revision have always been substantially agreed that nothing but patch work can be expected from efforts of this kind and patch work cannot give any noticeable relief to the industry. The revision must be general and the mining men of the country will not accept fundamental reforms which have not been thoroughly threshed out beforehand by means of a Commission and public hearings. Moreover, when it comes to the details of a new code, there are certain to be innumerable differences of opinion and a result can be reached only by having these focused on an authoritative Commission which has the power of decision.

With the postponement of the Commission for a year those individuals who felt that patch work was not objectionable and that the correction of the apex law was the main object to be attained began to press their views, but aside from their arguments it became a question to all minds whether it was not best to begin threshing out the details of a revision. That would have been the next work in order anyhow if the Commission had been created by this Congress and mining men might well begin now to adjust differences and get their ideas into practical shape.

The only objection to this course was the fact that it is desirable to have mining men pull together for the main object during as long a period as possible and to postpone the inevitable splitting up over details until the Commission has been appointed. The Mining and Metallurgical Society of America, however, decided to proceed with details and the first result of its efforts is attached herewith. It will be noticed that this is essentially a patch work measure, devoted to the abolition of the apex law and the discovery requirement.

NOTE.—The report of the Mining and Metallurgical Society of America referred to are the recommendations of the New York section of the society adopted April 24. Since these recommendations have been widely circulated and are quite lengthy we will not reproduce them.

MINING TOPICS DISCUSSED AT CONSERVATION CONGRESS MEETING

While the clash between the Pinchot forces and those of the conservationists, who have different ideas, caused most of the publicity given to the meeting of the National Conservation Congress held in Washington May 2, 3 and 4, to be devoted to that issue, there was much real work done.

Owing to the inability of a number of men, who had been chosen to represent certain mining topics, to be present this industry did not come in for as much consideration as otherwise would have been the case.

E. F. Burchard, of the United States Geological Survey, read an interesting paper on matters relating to iron. C. E. Lesher, statistician of the Geological Survey, made a report on mineral fuels. Dr. W. L. Saunders, president of the Ingersoll-Rand Drill Co., delivered an address. W. C. Phelan, of the Geological Survey, and F. G. Cottrell, of the Bureau of Mines, read papers. Mr. Phelan's paper treated of phosphates and potash, while that of Mr. Cottrell was devoted to nitrates.

Mr. Pinchot, the former Chief Forester, caused a sensation by making a sweeping charge that the convention had been packed by the water power interests.

M. L. Alexander, chairman of the Committee on Credentials, arose after the charge had been made and went into detail with regard to the credentials of those present, and it was largely due to him that the vote against Mr. Pinchot was so heavy.

Mr. Pinchot opposed the Shields Water Power Bill, which permits the private development of water power on a fifty-year lease. They claim this will lead to monopolization of resources and to the granting of franchises in perpetuity.

Gifford Pinchot, president of the National Conservation Association, in a statement, said:

"My attention has been called to personal attacks made upon me by the recently organized Water Power Development Association. This association is the publicity branch of the water power lobby which is working for the passage of the iniquitous Shields bill, and which just now, after careful preparation, captured and denatured the National Conservation Congress as a step in its campaign.

"The effect of the Shields bill is to give away in perpetuity the last great natural resource still owned by the people. I have, therefore, opposed it by every honorable means at my command. In consequence, the Water Power Development Association, in a recent open letter addressed to the President of the United States, asserts that what I said about this bill is 'incorrect and misleading.' In support of that statement, it proceeds (I quote from the press bulletin of the Water Power Association) to support its assertion as follows:

"'Mr. Pinchot also asserts that the Shields bill 'fails to require the necessary publicity and uniformity of accounts, and so makes the effective supervision of water power corporations impossible.'

"'Section 7 of the bill makes provision for exactly what Mr. Pinchot asserts is lacking.'

"A reprint of Section 7 then follows.

"When I made the statement thus denounced as false, it was, like every other statement I have made about the Shields bill, exactly accurate. My statement was made on January 29. Afterwards, on March 7, and in part as the result of my statement, the bill was amended on the floor of the Senate by the Kenyon amendment, which made the very correction, the need of which I had pointed out.

"The bill needed, but did not have, a provision to safeguard the public in the matter of publicity and uniformity of accounts. I called attention to that need. The provision whose absence I had criticized was thereupon added. Now comes the Water Power Development Association, and seeks by the distortion just described to discredit and set aside my attack on the Shields bill on the ground that my criticisms 'are contradicted by the provisions of the bill.'

"The bare recital of the foregoing facts should be enough. If every amendment I have demended in the Shields bill were to be made, then the method adopted in this case would justify the Water Power Development Association in denouncing every statement of the need of such amendment, made before the amendment took place, as unnecessary, misleading and incorrect.

"I should be glad to regard this instance of misrepresentation as accidental. Unfortunately, it does not stand alone.

"No good cause stoops to methods such as those. Attacks from men who employ them do not require to be answered. They merely require to be exposed. So far as it has importance, I regard the hostility of the Water Power Development Association as an honor to myself and an asset to the cause of conservation."

Among the resolutions adopted was the following with regard to public lands:

The established traditional and sound policy of the United States with respect to the disposition of its unappropriated public lands is opposed to the making of a direct revenue thereby, beyond the expense incident to the surveying, classification, and disposing of such lands. This policy is intended to encourage and promote the settlement and development thereof; and any Act of Congress, or any administrative construction thereof which is not in harmony with this policy does an injustice to the new States by placing them on an equal footing with the original States, and by discouraging and preventing the settlement of such new States and the development of their resources.

We favor a liberal and equitable administration of our public land laws, so that settlers will be encouraged to take up the public domain.

We favor expeditious settlement of public land cases by the Interior Department, the speedy examination of the character of entered lands where such examination is required by law, and prompt issuance of patents after the making of final proof.

We commend and approve the efforts of the present Secretary and present First Assistant Secretary of the Interior, and present Commissioner of the General Land Office, to liberalize and simplify the administration of the land laws.

We hereby express our approval of the Homestead Law which has been in force since 1862, and express the belief that such law is the basis of National prosperity in all States of the Union in which it has been applied.

We deplore unnecessary withdrawal or retention of any public lands and urge the earliest decision upon all withdrawals, and the restoration of all lands for entry, the retention of which is not found to be necessary to the public interest.

We favor such proper construction of the Mining Laws of the United States as will stimulate and protect prospecting and mining on the public domain, with a view to the development of our mineral and other deposits.

THE SHIELDS BILL

In view of the controversy over the Shields water power bill the following facts with regard to the bill are timely:

The origin of the Shields Bill is in no respect doubtful. Amendment of the law relating to hydro-electric development in navigable streams has been the subject for many years of exhaustive study and consideration by committees of both houses of Congress. The National Waterways Commission five years ago made an elaborate report on the subject. The Judiciary Committee of the Senate spent many months of research and study upon the legal questions involved. The House Committee on Interstate and Foreign Commerce conducted extended hearings on the subject. During each session of Congress for nearly ten years, moreover, the subject has been debated, in various phases, by both houses. The result has been a thorough probing of every doubtful point. The passage of the Shields Bill by more than a two-thirds vote followed this long process and resulted from it. To charge that the Shields Bill, say its friends, passed after the prolonged and open consideration above outlined, is the bill of any "interest" insults not only the Senate and Senators, but also public intelligence. The Shields Bill reflects the views of no one of the parties to this long and complex controversy. It is not even the bill of its introducer, nor of the committee which reported it. It was practically drafted by the Senate itself, in the light of long consideration and thorough knowledge. It is to be considered on its merits.

The distinguishing feature of the Shields Bill is that, unlike its predecessors, it presents a complete enactment under which hydro-electric development in navigable streams may go forward, subject to the direction and control of the Government whenever such development is physically and economically feasible. Under the present law an enabling act is required from Congress for each separate project. The Shields Bill fixes the fundamental requirements under which all such developments are to be permitted, leaving the issuance of the permit to the proper administrative department. By this means important resources hitherto locked up by the inaction of Congress are to be rendered available for the immediate and beneficial use of commerce and industry.

The bill fully safeguards every public interest developed and defined during ten years of public inquiry and discussion, say those who favor it. No permit can be issued until the Secretary of War is satisfied, after examination, that the plans, specifications and location are such as are adapted to "a comprehensive plan for improvement of the waterway in question, for the uses of navigation, and for the full development of its water power and for other beneficial public purposes," thus insuring the uniform development of our streams so long contended for by disinterested students of our economic progress. The mere holding of permits without development and use, possibly to prevent competition, is effectively prevented by stringent requirements relating to the time for beginning and completing construction of the necessary works. The system provided by the bill for the regulation of rates, charges and service, a subject of prolonged controversy, fully recognizes the rights and duties of the States and the Federal Government and insures cooperation, not conflict. Compensation to the Government in the form most useful to the public, namely, protecting and improving navigation, is provided in the sections of this bill dealing with locks and canals, and in the sections dealing with headwater reservoirs. The term of the permit is fixed at fifty years, and such permit must be relinquished by the holder at the end of that period if the United States, either for itself or for a subsequent permittee, determines to take over the property at its fair value, not including the value of the grant. Uniform accounting and reports covering assets, liabilities, capitalizations, cost of construction, cost of operation, etc., are provided for, with severe penalties for false entry or misrepresentations. Persistent breach of the conditions of the permit is penalized by forfeiture, and adequate means are provided for enforcing all State and Federal orders, regulations and requirements.

SAFETY ENGINEERING BECOMING A WIDELY FOLLOWED PROFESSION

There has been considerable attention paid in the Technical Press during the last year to the matter of Safety Engineering. The establishment by the Colorado School of Mines of a Chair in Safety Engineering also has been heralded widely and has resulted in considerable reference to the profession of Safety Engineering.

Several inquiries have reached the Bureau of Mines with regard to the number of persons following the profession of Safety Engineering, and as no information was available in regard to this matter the Bureau of Mines has gone to considerable trouble to secure the names and addresses of men who are following the profession of Safety Engineering. A list which has been compiled is very likely incomplete, but it is thought to contain the names of the more prominent representatives of the new profession.

The Bureau of Mines list is as follows: E. E. Bain, Ellsworth Colleries Co., Ellsworth, Penna.; A. A. Bawden, Pickands, Mather & Co., Hurley, Wis.; James Boston, Superior Coal Co., Gillespie, Ill.; C. M. Brading, Wisconsin Steel Co., Chicago, Ill.; F. E. Calkins, The Detroit Copper Mining Co., Morenci, Ariz.; P. A. Carmichael, Arthur Iron Mining Co., Hibbing, Minn.; J. J. Carrigan, Anaconda Copper Mining Co., Butte, Mont.; H. L. Chamberlin, Quincy Mining Co., Hancock, Mich.; Vernon P. Chappel, Iron Mountain, Mich.; D. E. Charlton, Oliver Iron Mining Co., Virginia, Minn.; Walter E. Chick, Pennsylvania Steel Co., Steelton, Pa.; F. E. Clough, Homestake Hospital, Lead, S. Dak.; William Connibear, Cleveland Cliffs Iron Co., Ishpeming, Mich.; A. W. Dennison, Black Hawk Coal Co., Black Hawk, Utah; Dr. F. C. Diver, Stag Canon Fuel Co., Dawson, New Mexico; W. H. Droll, Steptoe Valley Smelting & Mining Co., McGill, Nev.; J. B. Duff, Algoma Steel Corporation, Ltd., Sault Ste Marie, Canada; John Dunlop, 414 Columbia Terrace, Peoria, Ill.; F. E. Estes, Standard Coal Co., Standardville, Utah; Walter H. Finley, The Consolidation Coal Co., Fairmont W. Va.; W. W. Fleming, Republic Iron & Steel Co., Republic, Pa.; Geo. T. Fonda, Bethlehem Steel Co., S. Bethlehem, Pa.; J. J. Forbes, Provident Coal Co., St. Clairsville, O.; M. W. Alexander, General Electric Co., West Lynn, Mass.; Thos. Gibson, Union Pacific Coal Co., Rock Springs, Wyo.; William T. Graven, Springhill, N. S., Canada; George W. Grove, 705 Fidelity Building, Duluth, Minn.; John W. Groves, Tennessee Coal, Iron & R. R. Co., Birmingham, Ala.; Dr. B. C. Guldin, Minersville, Pa.; J. S. Herbert, Cambria Steel Co., Johnstown, Pa.; C. A. Horning, O'Gara Coal Co., Harrisburg, Ill.; Leonard C. Jones, 104 Insurance Exchange Building, Sacramento, Calif.; Austin King, Fricke Coke Co., Scottdale, Penna.; Charles Krallman, Peabody Coal Co., Glen Carbon, Ill.; D. Kranichfield, National Association of Manufacturers, Springfield, Ill.; H. L. Lack, Johnson & Johnson, New Brunswick, N. J.; C. E. McDermid, Utah Fuel Co., Winter Quarters, Utah; Charles C. McDougall, Athens, O.; Wallace E. McKeehan, Copper Queen Cons. Mining Co., Bisbee, Ariz.; Arthur Marsh, Box 197, Magna, Utah; George Martison, Gilbert, Minn.; Dr. J. M. Maurer, Shamokin, Pa.; R. K. Mead, Sagamore, Pa.; John J. Mecham, Masontown, Pa.; James L. Mills, Illinois Steel Co., Chicago, Ill.; H. E. Mitchell, Box Z, Eveleth, Minn.; Dr. F. F. Moore, Lucerne Mines, Homer City, Pa.; John E. Morgan, Northwestern Improvement Co., Roslyn, Wash.; W. H. Cameron, Continental & Commercial Bank Building, Chicago, Ill.; Hollis W. Overpecke, Oliver Mining Co., Virginia, Minn.; Henry R. Owens, Lehigh Wilkes-Barre Coal Co., Wilkes-Barre, Pa.; Duek Peckitt, Empire Steel & Iron Co., Wharton, N. J.; Sim C. Reynolds, Aetna Life Insurance Co., Houston, Pa.; George Roberts, Lucerne Mines, Indiana, Penna.; T. A. Schmidt, Morris Run Coal Mining Co., Morris Run, Penna.; L. A. Shoudy, Bethlehem Steel Co., South Bethlehem, Pa.; H. B. Smith, Illinois Steel Co., Joliet, Ill.; J. G. Smith, Inland Steel Co., Indian Harbor, Ind.; John W. Snow, Jr., Republic Iron & Steel Co., Palos, Ala.; Allen S. Snyder, Berwind-White Coal Mining Co., Windber, Pa.; B. M. Starnes, Sloss Sheffield Steel & Iron Co., Birmingham, Ala.; William A. Stevens, Glen Lyon, Luzerne, Pa.; C. S. Stevenson, Cleveland Cliffs Iron Co., Ishpeming, Mich.; J. Henry Williams, Cleveland-Cliffs Iron Co., Ishpeming, Mich.; W. W. Williams, National Assoc. Manufacturers, Springfield, Ill.; J. M. Woltz, The Youngstown Sheet & Tube Co., Youngstown, O.; W. Zuendorff, The Consolidation Coal Co., West Van Lear, Ky.

Mine Inspectors to Meet.

A considerable interest is being taken in Washington in the meeting of the Mine Inspectors Institution to be held at Joplin, June 13 to 16.

G. E. Sylvester is the president of this organization and J. W. Paul is secretary.

WAR CONDITIONS FORCE MANY COUNTRIES TO SEND ZINC HERE

Owing to the high price of zinc and the closing of a portion of the market in Europe, many countries, which never before have marketed this product in the United States, are now making importations. Guatemala has become a regular shipper of zinc to this country. Importations are also being received from French Africa, Costa Rica, Peru, Colombia, China, Italy, Spain, Australia and Mexico.

TUNGSTEN DEPOSITS HAVE NO SECONDARY ENRICHMENT

In tungsten deposits, as in most ore deposits, there is ordinarily no particular promise of the ores increasing in richness with depth. In fact it seems to be very much less true than with some other deposits for there is not the secondary enrichment that is found in many veins, especially those of copper and silver, therefore conservative prospecting is advised.

THE
MINING CONGRESS
JOURNAL

Published Each Month by
THE AMERICAN MINING CONGRESS.
Munsey Building. Washington, D. C.

Subscription Rate, per year............. $2 00
Single Copies.......................... .20

Entered as Second Class Matter January 30, 1915, at the Postoffice at Washington, D. C.

JUNE, 1916

EDITORIALS

ANNUAL CONVENTION TO BE HELD IN NOVEMBER

The 19th Annual Convention of the American Mining Congress will be held at Hotel La Salle, Chicago, Ill., during the week of November 13, 1916.

The official call for the Convention is now in preparation and will be issued in the near future.

A radical change is being made in the plan of conducting the Convention, designed to furnish opportunity for all members of the Convention to attend only such discussions as are of direct interest. This is accomplished by the creation of sections, the following thus far being arranged for: Precious Metals, Coal, Zinc and Lead, Oil, Steel and Iron.

The morning session of each day of the Convention will be taken up by a general meeting, at which only those broad questions will be discussed which are of general interest to the Convention, and the afternoon and evening sessions will be devoted to section meetings. In effect there will be five contemporary Conventions in progress at the same time, each devoting itself to that particular branch of the industry in which its members are directly interested.

The Chicago Convention of 1911 was the most largely attended Convention in the history of the American Mining Congress, and it is hoped by the broadened scope of the coming Convention to make the attendance very much larger than on any previous occasion.

Chicago by reason of its central location, its spirit of cooperation, its interest in the various branches of mineral production, and its ample hotel accommodations, furnishes an ideal place for a great Convention, and the present year's prosperity in the mining industry gives promise that the coming Convention will be the largest gathering of mining men ever assembled in the United States.

A very comprehensive program is in preparation and suggestions as to subjects which are of sufficient importance to justify consideration will be gladly received by the officers of the Congress.

COOPERATION THE GREAT NEED OF THE INDUSTRY

Cooperation is the great need of the mining industry. The operator in the neighboring gulch is not as unregenerate as you think, nor as he thinks you are. The sunlight of mutual understanding will dispel the clouds of doubt and do more than any other agency can do to bring about better mining conditions.

The 19th annual convention of the American Mining Congress, to be held in Chicago, November 13 to 17, is a common meeting place where all may enter on equal terms and where each may barter his distrust for good fellowship.

This is an age where cooperation succeeds and individual action only wins as it is in accord with the activities of others.

The unsuccessful kicks of minority stockholders have not interfered materially with the success of corporations, while the protests of individual members of unorganized business enterprise have been complete barriers to business success.

The bituminous coal industry furnishes a most striking illustration. Instead of working as a unit for the solution of the problems common to the industry each operator pursues his own sweet will and preserves his own business independence until his banker takes possession of his property and turns it over to his more successful competitor. Still independent outside the hours of his service as a hired man he is only occasionally annoyed by duns for the unsatisfied obligations of his independent business experience.

Shall this process be continued until a few large corporations control the industry and the public is robbed of its right to a reasonable competition in a business which it must patronize? The bituminous coal mining industry is going to be organized—either by its present owners or by the banks. Which shall it be?

TRADE COMMISSION REQUEST DESERVES PROMPT REPLY

The Mining Congress Journal urges upon the coal operators, to whom request has been made by the Federal Trade Commission for information, to fill in the blank it sent and return it to the Commission promptly. Now that an appeal has been made to the Commission to investigate the conditions of the industry there is every reason why complete cooperation should be extended immediately.

The Trade Commission will be helpless to aid the coal mining industry unless information is placed before it upon which it can pass an intelligent opinion.

We feel sure that the failure to respond more promptly to this request has not been prompted by any desire to hamper the Trade Commission in its effort to reach a satisfactory conclusion as to what steps are necessary in behalf of the industry. This is the first opportunity that the coal industry has had to present its case to a sympathetic governmental agency and an agency through which it can hope for the inauguration of a movement through which better conditions may be hoped for.

FOSTER BILL NOT LIKELY TO BE ENACTED BY CONGRESS

Complying with its duty of supplying the mining industry with unbiased news and uncolored reflections of Washington opinion, the Mining Congress Journal is presenting a good many of the arguments advanced by those who favor a revision of the mining laws without having the matter studied first by a commission. This is not to be taken that the editorial policy of the Journal supports this view. It is the belief of the great majority of the members of the American Mining Congress that a commission must investigate the desires of the miners of the nation before attempting to revise the laws.

The Mining Congress does not believe that any bill for this purpose will be enacted by Congress without the support of a general movement based on a complete investigation of the problems involved, and it still urges the appointment of a government commission to collect systematically first hand information from the mining camps of the country. The Foster bill should not be considered by Congress.

Since the majority of the members of the Committee on Mines and Mining believes that a commission is not necessary, we are very glad to give space in our news columns to the reasons they advance for their stand. Since the Journal is the only mining paper paying more than casual attention to Washington mining news it is the more incumbent upon us to see that the mining public is informed in detail as to the ideas held by the majority members of the committee.

LOSS WILL FOLLOW CUT IN OIL APPROPRIATION

The cut of $10,000 in the appropriation for oil and gas inspection in Oklahoma is expected to curtail important work. The item in the Indian Appropriation bill provided for $25,000 for the inspection of oil and gas lands throughout Oklahoma. This work is intended to prevent loss of fuel resources and the action of Congress in reducing the amount, is being criticized by those here who are in position to understand the situation in Oklahoma. Protests are being received in large numbers from Oklahoma.

Last year an appropriation of $25,000 for this work was allowed. Of this sum only $15,000 was expended. This was due to the fact that the Bureau of Mines was building up an organization so as to make intelligent and wise expenditures of the appropriation. The organization was built up with the full understanding that the work was to be statewide, and that an annual appropriation of $25,000 would be forthcoming. The bill as passed limits the work to lands of the five civilized tribes. This leaves some very important pools in Oklahoma without inspection.

The bill as introduced in the House provided simply for $15,000. An erroneous conclusion, that if $15,000 was sufficient for this work last year that it would be sufficient this year, was reached.

The error of this conclusion was brought up in the Senate and an amendment passed increasing the appropriation to $25,000 and provided for state-wide work. In conference, however, the Senate amendment was stricken out and the House provision prevailed.

CRIMINAL WASTE ALLOWED IN NAME OF CONSERVATION

In Montana are large deposits of phosphate rock of such low grade that it can only be utilized in conection with cheap sulphuric acid. The smelting plants of Montana are wasting an enormous amount of sulphuric acid, valueless except as it may be utilized in converting the otherwise worthless phosphate deposits of Montana into commercial fertilizers. The use of these fertilizers would very largely increase agricultural production.

The smelting interests of Montana are ready and anxious to construct the plants necessary to the utilization of these phosphate deposits which are owned by the government, but which by administration orders are withdrawn from entry. The farms need the fertilizer. Montana needs the new enterprise—the deposits are tied up in the name of conservation while the sulphuric acid, without which these deposits will be forever worthless, is being wasted. A few years will exhaust the sulphide ores from which sulphuric acid may be cheaply obtained and thereafter the phosphate rock will be utterly worthless.

If the writer were President of the United States he would cancel the withdrawal order as it applies to Montana phosphate bearing rocks and at once permit the utilization of these most valuable deposits and deliberate upon the niceties of theoretical conservation at some more convenient time.

ALASKAN RAILWAY NEEDS BETTER ADMINISTRATION

The laborers employed in the construction of the Government railway in Alaska recently struck, because the award of the commission sent by the President to adjust the differences was not made at the expected time. The incident has called attention to the very meager results which have thus far been accomplished in this work and the critics of Government railway construction are already calling attention to the prediction that this construction would effectively cure Congress of its tendency toward this character of extra governmental activity.

Canada's latest experience in railway construction has been an unfortunate demonstration. The railway from Moncton, B. C., to Winnipeg, Manitoba, 1,804 miles, the cost of which was estimated at $61,415,000 or $34,083 per mile, actually cost over $178,000,000 or $98,895 per mile with no charge for interest on the bonds during construction.

The American Mining Congress supported the bill providing for the Alaskan railway, not because it believes in the principle, but because it believed that the Government, which had deliberately withdrawn all the incentives which usually induce capital to construct railways into undeveloped territory, should itself assume that responsibility.

The management of the Panama Canal construction by a many-headed commission proved to be a dismal failure. It was only when an executive was put in charge that the nation was satisfied with results.

The progress being made by the three-headed Alaska Railway Commission is not promising. The President may well consider the importance of substituting for it an effective executive agency.

SHOULD KEEP OUT OF ARMOR PLATE MANUFACTURE

It is somewhat amusing to note the influence upon public thought of an opportunity to foster the development of local industry. The "pork barrel" is usually condemned, but the soft pedal is noticed as to those items which benefit the critics locality. The confidence of the prisoner on trial for stealing a sheep was explained by the statement that every man on the jury had received a piece of the mutton.

The prosperity of the United State has been largely based on individual effort. It has been regarded as the duty of the government to protect its citizens against unfair competition and against oppressive monopoly and otherwise to leave them the fullest liberty in business pursuits. That the Government should enter into business competition with its own citizens has been generally regarded not only as dangerous but subversive of the fundamental principles upon which our government was founded. The inefficiency of Government operation even of governmental affairs is notorious. No one has yet been audacious enough to deny the statement of the late Senator Aldrich that he could save the United States Government three hundred million dollars annually by applying ordinary efficiency to its business affairs. And yet Congress is proposing that the Government shall enter into the business of manufacturing armor plate. Millions are to be spent in the equipment of a plan designed for this purpose and without possibility of other use. The danger of such a proposal is manifest by the following excerpt from the *Philadelphia Evening Ledger:*

> Assuming that the armor plate factory is to be built, there is evidently only one place for it to be. Every consideration of economy, convenience and expediency points to the League Island Navy Yard. There is room for it. The raw materials can be easily obtained there. The other armor plate factories are in this State because the facilities for the manufacture of steel here are better than in any other part of the Union. The reasons which have led private business men to locate here run with equal force when the Government plans going into the same kind of business.
>
> The Chamber of Commerce, which numbers in its membership the leading business men of the city, is doubtless alert to the possibilities in the situation. They understand the advantages which will accrue to the city from the development of the navy yard through the increase in the number of men employed, the demand for houses, clothing and food to support their families and in the added tonnage of freight on the railroads over which the supplies for the yard must be hauled. There can be but one opinion in the chamber on the subject. Its leaders are expected to prepare to present to the proper authorities the overwhelming arguments in favor of League Island as soon as the bill becomes a law, if they have not already begun to formulate those arguments. Even if they are opposed in theory to Government manufacture, they can still insist that if there is to be a Government plant it should be here, in the interests of economy and efficiency, where men skilled in steel working can be secured with ease. The chamber is the proper body to speak for the city, and the city expects that it will let its voice be heard in no uncertain tones.

Until communities can be endowed with more of intellectual honesty there is little hope for economy in Government expenditures.

The whole plan is wrong in theory, and will prove to be a crime in practice. The Government should not go into business; it should not compete with its own citizens; it should not itself be guilty of the unfair competition which it created a Federal Trade Commission last year to prevent; it should not destroy immense properties created to meet and which have met its needs in the past, and it should always remember that the industrial efficiency of all its productive forces now and always must be the foundation of adequate preparedness.

NEED OF MINING CONGRESS JOURNAL IS PROVEN

The members of the American Mining Congress are in a position to be of very material help to the organization's official publication. The MINING CONGRESS JOURNAL, now well along in its second year of publication as a regular monthly magazine, is being issued at some loss. There has been ample evidence that the information given to members through the JOURNAL is of sufficient value to justify its publication even if no advertising were carried. The JOURNAL is going to be continued whether it is looked upon with favor by advertisers or not. We feel, however, that there is no reason for a deficit on the JOURNAL. The most active mining men in the United States are members of the American Mining Congress. Their aggregate purchases of machinery and supplies amount to millions of dollars yearly. It certainly is to the interest of manufacturers and dealers in supplies for mines to make their announcements in this publication, which is owned by consumers of their products. An advertisement in the MINING CONGRESS JOURNAL should be of very great value due to the fact that members are certain to look with favor on advertisers who lower the expenses which they have to meet.

As is the case with all new publications, it takes considerable time to convince advertisers as to its actual worth as a medium for presenting their propositions. In order that advertisers may learn more quickly of the value of our publication, it would be of considerable help if members would call attention to the manufacturers, with whom they are dealing, to the fact that they are overlooking an opportunity that will be profitable to them and to us. Even a postal card would have influence in this direction.

Advertising is not being solicited for the MINING CONGRESS JOURNAL on a donation basis. If machinery manufacturers or other advertisers want to contribute to the Mining Congress, which they should do, such contributions should be made directly and as such. We are interested in securing only such advertisements as will be profitable to the purchaser of space.

The very fact that the mine operator is a member of the American Mining Congress indicates that he is a progressive man. Narrow and grasping men usually are not found in cooperative organizations, which have as their object the betterment of the industry as a whole. The membership of the American Mining Congress, which is the only national organization of mine operators, is an exemplary body of men. The majority of the membership is among the younger operators, who have yet to reach the zenith of their influence and accomplishments. They are the class of men advertisers want to reach. There is no better means of reaching them than through the advertising columns of this paper.

If each member will cut out this editorial and attach it to his letter-head and send it to one of the firms with which he is doing business, he will have contributed not a little to the wiping out of the JOURNAL'S deficit.

MINING DISCRIMINATED AGAINST IN CONGRESS

Mine operators will find food for thought in an incident which occurred last week in the Senate Committee on Agriculture and Forestry.

Citrus Canker has appeared in Florida and other Gulf States and is doing damage to the orange groves there. Representatives of the citrus growers from Florida, Alabama, Mississippi and Louisiana came to Washington some months ago requesting Federal aid in stamping out the disease. Despite the fact that the States had contributed very little toward this work, the Committee on Appropriations granted them $300,000. The Agricultural appropriation bill provides $250,000 more for this work. Not satisfied with these amounts representatives of the citrus growers appeared before the Senate Committee on Agriculture and requested additional funds. The committee was willing to grant them nearly any amount that could be justified and was greatly in favor of increasing the appropriation materially.

While the matter was being discussed in the committee someone suggested that the recommendation of the Secretary of Agriculture would be a necessary step in the proceedings to make an appropriation, and at the request of a member of the committee Mr. Houston was communicated with by telephone. He advised them that it would be absolutely impossible to spend to advantage any more money than had been appropriated already.

Some members of the committee were absolutely indignant that he should take such a stand. One Senator demanded, with considerable heat, that Mr. Houston be called upon to reduce to writing what he said over the telephone.

The next day Mr. Houston appeared personally before the committee. He refused to be cajoled into taking more money for the citrus canker campaign and finally the committee agreed not to press the matter further, since it would be possible to get an emergency appropriation in case the money should be expended before the next appropriation bill.

This is a concrete illustration of the ease with which appropriations are obtained for agriculture. Every year the Agricultural Department is embarrassed by the desire of Congress to force more money upon it than can be spent effectively.

Contrast this with the mining industry, which produces practically as much new wealth each year as does agriculture. The eradication of the Southern cattle tick gets almost as much money from the government as does the Bureau of Mines. When the mining industry comes to Congress and requests an appropriation of $25,000 that a commission may investigate its legislative needs, it is turned down with a lack of consideration that makes the mining industry look like a stray dog in comparison.

Mining is so much more technical than agriculture that it deserves more Federal aid. Not that we think agriculture has received too much money. That industry has been aided remarkably by government work. Its appropriations should be increased and expanded as rapidly as possible. We only urge that its great companion industry should receive equally generous treatment.

The reason for the discrimination is perfectly apparent. The numerical strength of those engaged in agriculture is much greater than those engaged in mining. Mining is congested into isolated districts, comparatively speaking, and its friends are not in a position to present such a formidable wide-flung front at the polls. Just because this is the case, however, the outlook is far from hopeless. What the mining industry lacks in numbers it can make up by close cooperation.

Unfortunately there is no great industry in which so little team work is done as in mining. This fact is being realized more and more throughout the country and a better day is dawning. The remarkable prosperity which the industry is enjoying at this time is calling attention to the fact that it has been abnormally depressed in the past. Mining should be normally just as productive as it is at present. It can be made so. It will take a high degree of efficiency and much cooperating and will require a great deal of research and study, but such a plane of activity can be reached and held.

STANDARD ACCIDENT FIGURES ESSENTIAL

While it has been nearly 50 years since the first mine inspection law was passed in the United States, there has been no standard classification of accident statistics so that all of the States would be on the same basis. Such statistics are absolutely essential in order that the true accident hazard may be studied to the best advantage. All of the important coal-mining countries of Europe have long had such records, while the United States has lagged behind in this respect. In the early days of the European inspection service the fatal-accident rates were high, fairly comparable with the rates in this country. Systematic records, and thorough inspection have resulted in remarkably low fatality rates. Similar results can and should be attained in this country.

Forty years after the enactment of the first State inspection law the Federal Bureau of Mines was created by Act of Congress. The Bureau has done excellent work in its educational campaign for safety in mines, although it had but little standard data upon which to base its operations.

Through the publication of Bulletin 115, "Coal Mine Fatalities in the United States, 1870 to 1914," the Bureau of Mines places before the operators, inspectors, compensation commissions and insurance companies a comprehensive diagnosis of mine accidents. It furnishes an immense amount of valuable information concerning the causes of coal mine accidents—data that show the need of the safety-first campaign; that show the result of efficient inspection; that place, for the first time, all of the States on the same basis; that give first-hand information which will furnish a just basis for compensation insurance, all of which has been needed. We congratulate Mr. Albert H. Fay upon the painstaking manner in which he has arranged and classified the facts showing the causes of more than 50,000 fatalities gleaned from the inspector's reports.

This report is a strong plea for calendar-year statistics for the reason that all of the figures from 1870 to 1914 are on this basis. Now that Mr. Fay has given the coal mine accident statistics for all of the states by calendar years, we hope that the inspectors will continue the State tables on this basis.

A publication, such as this, will long be used as a standard reference work on mine accidents. It belongs to the first rank of technical literature.

LOSS RESULTS FROM DELAY TO THE SUNDRY CIVIL BILL

The delay in passing the Sundry Civil appropriation bill is resulting in considerable loss to the Government and to the mining industry. This bill carries the appropriation for the Geological Survey and the Bureau of Mines, and until this money is available it is impossible for them to begin the regular field work. All the field parties should have been at work long before this, but as it is a large number of high-salaried men are being held in Washington, where their services cannot be employed to the best advantage at this time. This is due to the fact that all their work has been completed with the idea of returning to the field before this time.

Fortunately this year the appropriation for the Alaskan work was handled as an emergency matter, and this work will not be delayed. One year recently very little work was done in Alaska owing to the delay in securing the appropriation.

Just why Congress insists on making it impossible to conduct many of the Government activities on a businesslike basis is hard to say. Perhaps the only solution is to elect more practical business men and fewer lawyers to the legislative bodies.

FAMILIAR FACES REPRODUCED FOR JOURNAL READERS.

Attention is called to the series of personal sketches which is appearing in the JOURNAL. Mining men throughout the United States are brought in frequent contact with representatives of the Geological Survey and the Bureau of Mines, who collect data and make studies of their districts. In the course of long service these men have become known to a host of mine operators and we believe it is of decided interest to review their work and incidentally to print their pictures.

The mining industry owes more than is generally realized to these very capable men, whom the government has selected with studied care to assist the mining industry. As we are brought in daily contact with their work here in Washington we are in position to state unqualifiedly that these men are deserving of the confidence and the hearty cooperation of mining men. Great care is taken by the directors of each—the Geological Survey and the Bureau of Mines—to send only tried and trustworthy men into the field.

RECOVERY OF POTASH FROM CEMENT PLANTS BEING WATCHED CLOSELY

Government Experts Inclined to Attach Deep Significance to Success Being Obtained by Cement Manufacturers—Bureau of Mines Metallurgists Also Much Interested in Blast Furnace Possibilities

"The Bureau of Mines, in cooperation with the Geological Survey and the Bureau of Soils, has been studying the question of securing potash as a by-product from various existing industries. Of these, of course, the mother liquors from the salt works have long been known as potential sources of potash, but have never attained commercial importance, owing to their small and scattered nature and the expense of production of the finished product from them. Closely related, but of vastly larger possibilities, are such deposits as Searles Lake in California, where the potash is claimed to occur in sufficient concentration in the saturated liquors permeating these great salt fields to be commercially workable and to be there in quantity sufficient to supply the entire present American consumption for many years to come," says George S. Rice of the Bureau of Mines. "Questions as to land titles have stood in the way of final commercial development, and these cases are still pending in the Land Office.

"The possibility of working the various potash alumina minerals, such as feldspar, lucite, or alunite, so as to recover on the one hand pure alumina for the manufacture of either refractories or metallic aluminum and potash on the other, has also attracted much attention and undoubtedly all of these and other possible sources of potash, such as kelp, in which the Department of Agriculture has been particularly interested, should be kept clearly in mind in their possible commercial relations to one another, and any legitimate development encouraged, for the fertilizer question will always be with us and grow with our national growth.

"However, from the standpoint of by-product production from already established industries, the two possibilities which stand out with the greatest probability of being able to really meet the whole or a large part of our national demand for potash, are the manufacture of hydraulic cements and iron smelting.

"While the recovery of potash from cement manufacture is in itself so new a development that its wide reaching significance, not only to agriculture but possibly even to the building trades themselves is not yet generally appreciated, still it has gone far enough to thoroughly arouse the cement manufacturers of the country themselves to its importance and the character and local distribution of this industry is such as to insure pretty well quite a general adoption of the potash by-product feature wherever feasible and advantageous. It also seems probable that in the location of new cement mills the matter of potash content of the raw materials will come to be one of the normal determining factors.

"With regard to potash from the iron blast furnace much less progress has yet been made. The Bureau's metallurgists believe there are possibilities here quite comparable to those in the cement mills and have been urging upon those in authority in the industry the importance of notonly a careful examination of blast furnace dusts and gases for potash, but likewise systematic studies on the effect of operating conditions on the same, with the object of obtaining maximum possible yield of potash.

"There is, as far as known to the Bureau Staff, but one company in this country producing potash from blast furnace gases in commercial quantities, and even at present is on a relatively small scale, and the company seems to be rather reticent on the subject as yet.

"You may be interested in a report, which came to one of our engineers through personal channels, to the effect that, at least up to a few years ago, a blast furnace plant in Scotland drew off a constant stream of gas from about 2 feet above the mantel of the blast furnace, colled it in a condenser and recovered considerable amounts of potassium cyanide. This installation has apparently never had any publicity. The subject has, however, of late been covered by some extent by United States patents, apparently inspired by St. Lowthrop Bell's original publications; but these, as far as known, have not been the direct stimulus to any practical work in this direction."

REPORTED EPSOMITE DISCOVERY DISCOUNTED AT SURVEY

A reported discovery of epsomite deposits near the Arkansas-Missouri line called forth this opinion from the Director of the Geological Survey:

"It is not at all likely that in a country having so great a rainfall as northern Arkansas and southern Missouri, a deposit of epsomite of any great extent can exist, and it seems likely that there is too much ground water in the rocks for a deposit to increase away from the surface. The epsomite found is gradually brought to the surface of water and there crystallizes. Digging in a short distance would disclose rocks which are permanently wet, and, at the same time, a disappearance of the epsomite, as epsomite or epsom salts is readily soluble in water.

Current Traffic Development

In case No. 5992 of the Black Mountain Corporation *vs.* the Louisville & Nashville Railroad Company, the Interstate Commerce Commission found:

1. The combination rate of $1.95 per net ton on bituminous coal from the Black Mountain district in Virginia to Atlanta, Ga., applicable by way of the Louisville & Nashville Railroad and Southern Railway through Cumberland Gap, Tenn., found to be unreasonable. The Louisvile & Nashville Railroad required to establish a rate for the future not to exceed $1.70 per net ton to apply over its own rails through Corbin, Ky., or in connection with the Southern Railway through Cumberland Gap.

2. The combination rate of $1.74 per gross ton on bituminous coal from the Black Mountain district to Norfolk, Va., for delivery to vessels destined to points outside the capes of Virginia, found to be unjustly discriminatory to the extent that it exceeds the rate from Norton, Va., to Norfolk, applicable on like traffic, by more than 20 cents per gross ton.

Held Not Discriminatory

In the matter of import and domestic rates, Clay, Docket No. 6592, the commission makes the following finding:

Because of informal complaints filed with the Commission to determine the propriety of the import rates on English clay from Gulf ports and north Atlantic ports to points in central freight association territory which were lower than the domestic rates on clay mined in the State of Georgia to the same destinations, a hearing was had under a general order of the commission which provides for an investigation into the rates, practices,, rules and regulations governing the transportation of imported property and the relationship between the rates for such transportation and for transportation of similar property originating in the United States held, that the present adjustment has not been shown to be unjustly discriminatory against domestic traffic.

Zinc Rate Increases Not Allowed.

In case No. 5931, the Wellington Mines Company of Breckenridge, Colo., *vs.* the Colo. & Southern Railway Company, the Commission finds:

1. Increased through rates on zinc concentrates from Breckenridge, Colo., to Bartlesville and Collinsville, Okla., found not to have been justified in respect of the component applicable from Breckenridge to Denver, Colo. Reasonable proportional rate prescribed for the future.

2. The shipments on which reparation is asked exceeded in value per ton the value of the ore on which the rate here prescribed is predicated, and therefore complainant is not entitled to reparation.

Through Rate Precluded

In cases No. 6917 and 6917 (Sub-Nos. 1 to 8), Hayden Bros. Coal Corporation *vs.* the Denver & Salt Lake Railroad Company, the decision of the Commission is summed up as follows:

Through routes and joint rates on soft coal in carloads established from Oak Hills, Colo., and points taking the same rates, to stations in Kansas, Nebraska, Missouri, Iowa, and South Dakota, on the Atchison, Topeka & Santa Fe Railway, the Missouri Pacific Railway, the Chicago & Northwestern Railway, and the Chicago, St. Paul, Minneapolis & Omaha Railway. Section 15 of the act precludes the establishment of through routes and joint rates via the Union Pacific Railroad from Oak Hills to stations on the Missouri Pacific Railway in Kansas south of Kanopolis, Kans.

L. & N. Rate Upheld

In case No 7860, of the Ulland Coal Company *vs.* Louisville & Nashville Railroad Company the rates charge for the transportation of coal in carloads from various points on the Louisville & Nashville Railroad in Kentucky and Tennessee to Hunt Street, Cincinnati, Ohio, were found not to have been unreasonable and reparation was denied.

C. & O. Rates Suspended

The Commission suspended from May 1 until August 29, 1916, the operation of certain items contained in Supplement No. 15 to Chesapeake & Ohio Railway Company tariff I. C. C. No. 6220.

The suspended items provide for the cancellation of joint rates on coal, in carloads, from Chesapeake & Ohio Railway mines to stations on the Toledo & Western Railway. The proposed combination rates are from 5 to 10 cents per ton in excess of the present joint rates.

Coal Hearing June 12

A hearing in the matter of rates on bituminous coal to central freight association territory, as covered in Investigation and Suspension Docket 774, will be held in Washington June 12, before Examiner Marshall.

Hearings Are Assigned.

Oral argument will be heard in Washington by the Commission June 8 in the case of the Domestic Coal Co. *vs.* K. M. Railway.

A hearing has been assigned for June 12 before Examiner Marsh in I. & S. No. 774, Bituminous Coal to Central Freight Association territory.

MUCH CRITICISM OF FOSTER BILL IS BASED ON MISTAKEN STATEMENTS, IT IS SAID

Dr. Foster, Chairman of Committee on Mines and Mining of the House, says His Bill is Simply a Starting Point—Wants Constructive Suggestions From Those Who Know Needs of Enterprise

"Some well known mining publications have given the Foster bill a very cursory reading, judging from the criticisms," declared Dr. Foster recently. "A reading of the bill might lead to the conclusion that these able critics look little further than the title. Some very positive statements as to the contents of the bill are not only misleading but wholly without foundation. Readers would naturally be prejudiced against the bill by relying on statements in these prints, when if many of the provisions were stated as they actually are, different conclusions might be reached," continued the Chairman of the House Committee on Mines and Mining. "To illustrate: One distinguished editor stated broadly that the bill gives the locator the privilege of staking a claim 1,500 by 600 feet, or of staking one 2,100 feet square; and the editor concludes that naturally he would take the claim 2,100 feet square. As a matter of fact, the bill gives the locator the privilege of locating FIVE claims 1,500 by 600 feet, or ONE claim 2,100 feet square. Had the distinguished editor figured for an instant he would have discovered that the five claims 1,500 by 600 feet about equal in area one claim 2,100 feet square. Thus the option would be left to the locator to stake his one claim in one place or distribute his five claims over a wider territory.

"The real questions for the locators to determine are: (1) Should there be any difference in the sizes of mining locations? (2) What would be the most practical size of the claim? (3) What limit should there be on the number of claims? (4) Should the claimants be limited to a certain stated number, or should the number be limited as to a given district, or as to a particular State?

"Reasonable answers to these questions will go far toward giving the Committee on Mines and Mining the information it desires on this particular subject.

"If the editors of the mining publications have no suggestions to offer along practical lines they can depend upon it that their irrational criticism based on mistaken statements of the actual contents of the Foster Bill will not hasten the day for mining law revision.

"It is not expected that all persons interested in the mining enterprise will agree on all the provisions of the bill, but destructive criticism purely will not advance the mining interests and will not improve this particular bill or hasten any legislation looking to the improvement of the mining laws.

"The bitter and destructive criticism on the existing mining laws did not succeed in bringing about the appointment of a commission, so earnestly desired on the part of so many interested persons in mining legislation. It is asserted in some quarters that the zeal of the destructive critics accomplished the downfall of the cause.

"Both the Senate and House Committees on Mines and Mining are composed of reasonable men and both committees are equally desirous of obtaining needed legislation and the complete revision of the mining laws, but these committees will not be vastly influenced by a class of critics who by their criticisms say, in effect, that 'if we cannot have our method adopted, we will obstruct all attempts at revision.'

"The purpose of the bill is to afford a starting point for the proposed legislation and the members of the committee do not regard it by any means as the final expression on the subject. The very fact that the committee immediately on the introduction of the bill, caused copies of it to be widely circulated among the practical miners of the western States as well as mining engineers and metallurgists throughout other States, accompanied by letters soliciting objections and suggestions for improvement, indicates that the provisions of the bill are tentative rather than conclusive and that the bill is subject to the approval of the persons interested in mining. This puts it up to the mining men to get together and unite on such features as may be most beneficial to the enterprise, and press these for enactment into law."

The following statement may be regarded as a composite view of a number of those who favor a change in the laws without a commission's investigation:

"Persons familiar with the literature of the Mining and Metallurgical Society of America are aware of the attitude of the society toward a revision of the mining laws. Members who were present at the December, 1915, meeting of the society, in Washington, and others who have read the proceedings of that meeting will remember that the Society approved a resolution which reads: '1st. The mining laws should be revised not piecemeal, but thoroughly, so as to coordinate and harmonize its various provisions.' By these and other similar resolutions the Mining and Metallurgical Society has more than once gone on record as favoring a complete and thorough revision of the mining laws.

"From an editorial in the *Engineering and Mining Journal* of April 29, 1916, it would seem that the New York Section of the Mining and Metallurgical Society of America, at a meeting held at the 'Engineers' Club,' has abandoned the idea of a complete revision of the mining laws and has offered instead some piecemeal or patch-work suggestions that in themselves lead nowhere and accomplish nothing. From the editorial it would seem that the New York Section is not thoroughly 'rooted and grounded' in its desires. At the first sitting it changed the proposed size of locations from 660 feet square, or 10 acres, to claims 1,320 feet square, or 40 acres. From a provision requiring $100 annual work, it changed it to $200 with the proviso that $300 per claim should be paid annually into the 'United States Land Office,' in lieu of the performance of the work.

FAVORS BIG COMPANIES

"By article III any number of claims can be located and held by one person or association. No suggestion or provision whatever is made for development, the $300-payment provision being the penalty for failure to develop. It needs no tab or tag to show that the suggestions of the New York Section is for heavily capitalized corporations. The average prospector and the industrious locator are not all prepared to perform $200 worth of work on each claim or to pay in lieu thereof annually $300. This proposed method of corporations cornering the mineral lands and making the lieu payments would not only stop development work but deprive the mining States of the benefit of work and improvements as well as production of mining claims. The New York Section might have entitled its proposed provisions: 'An act to permit corporations to acquire the mineral lands and to stop development and production, and to deprive all individual prospectors and locators from acquiring mining claims.'

"The New York Section in harmony with the provisions noted, did not forget to provide for the repeal of extralateral rights, indicating further an intention to put the prospector and locator out of commission.

"The comprehensive knowledge of the New York Section as to the force and effect of the mining laws and as to the effect of the repeal of the extralateral-rights provision is fully evidenced from the fact that it deemed it necessary after taking from the locator his extralateral rights to confirm to him all minerals within the bounds of his claim, after excepting the existing extralateral rights of mining claimants. This leads to the conclusion that the New York Section seems to believe that the existing mining laws grant nothing but extralateral righs, and that an owner of an existing claim is not the owner of the minerals within his surface boundaries other than that of the vein creating his extralateral rights. If there is anything in the Foster bill that begins to match this, it has not been called to attention.

PRESS CRITICISM

"The issue of the *Mining and Scientific Press* of April 22, 1916, contains a rather weak criticism of the Foster bill and makes some uncomplimentary and needless reflections on members of the House Committee on Mines and Mining. Like some other criticisms of the bill the editorial does not state correctly even the leading features of the bill.

"Notwithstanding the long experience of the editor in affairs relating to mining and his conceded knowledge of the application of the mining laws to existing conditions, the editor makes but one suggestion as to what should be in a mining law. He insists that the lawmakers should start with defining a 'vein or lode' and an 'outcrop.'

"In justice to the bill it must be said that there is nothing in it quite so ridiculous as this suggestion of the distinguished editor. The necessity of a mining law defining a 'vein or lode' or an 'outcrop' is about as reasonable as to argue that a contract with a builder to construct a house should define a 'house;' or that a law making it a misdemeanor for one person to commit an assault and battery upon another should define the term 'assault and battery.' If the geological definitions of 'vein' and 'lode,' as it has been defined over and over again, are not sufficient to advise a locator or a miner, then a mining law could not aid the locator or miner if it contained nothing but definitions! The editor's criticism seems to be wholly nullified by the weakness of his sole suggestion as to what the bill should contain.

"The editorial quotes a part of the provision of the bill permitting a locator who has located his claim on an outcrop and thereby obtained extralateral rights, as to junior locations, to enter upon the surface of any such junior location 'and drill or explore by vertical openings, or enter the workings of such junior locator . . . to aid in making such survey and identification of his vein or lode.' And then the editor proceeds to poke no little fun at this provision. A moment's reflection or a few minute's investigation into the mining laws of the various States, both metal and coal, would disclose a provision in the statutes of perhaps every mining State in the Union giving an adjoining mineral proprietor the right to enter the workings of another adjoining proprietor and making a survey of the same for the purpose of ascertaining whether any trespass is being committed on his own property. These statutory provisions have time and again been held constitutional and have been enforced as shown by the numerous cases relating to both coal and metal mines. And even in the absence of statutory provision, equity courts have granted and enforced this right. The Foster bill as to this particular provision simply follows along the lines of existing statutes.

DIFFER ON APEX LAW

"It can safely be predicated that the opposition to the Foster Bill grows out of a single feature. It is a well known fact that the persons interested directly and even indirectly in mining are at swords' points over what is familiarly known as the apex law or the question of extralateral rights. Mining engineers are practically unanimous in their demand for the repeal of this provision as it now exists in the mining laws. The old prospector, the locator and others more directly interested in direct mining operations are almost as equally unanimous in their objections to disturbing this feature of the laws. That the alleged wrongs caused by this provision in the mining laws has been highly exaggerated and grossly slandered is only patent to the careful student of mining legislation. That its practical operations have been wise and beneficent in the main, stands attested from the day Senator Stewart made his speech in the United States Senate in 1866, to the present time through its practical workings in unnumbered cases.

"It is conceivable that if the Foster Bill had repealed the extralateral rights provision it would have been swallowed whole by many of the critics who now so viciously condemn it. But on the other hand had the bill repealed this feature an equally vicious protest would have been heard from prospectors and miners. Indeed a technical paper severely criticised the bill on the ground that it did repeal the extralateral rights provision of the existing law. The fight now being made over the Foster bill indicates clearly the point of cleavage. This 'apex' law is the 'Dead man's hill' of attack and counter attack, and this is the rock on which the miners are hopelessly split. Congress can be advised that it will be damned if it passes a bill retaining the extralateral rights provision; and Congress can be assured that it will be equally damned if it passes a bill repealing this provision. It can be asserted that certain elements professedly in sympathy and interest with mining enterprises, would prefer to defeat any bill however meritorious otherwise, that did not repeal the extralateral rights provision. On the other hand prospectors, locators and miners, fearing the repeal of this provision, are now asserting through press and correspondence that they are satisfied with the present mining laws and even protesting any change or improvement.

RESTRICTS EXTRALATERAL RIGHTS

"The Foster Bill does not repeal the extralateral-rights provision but does place some necessary and needed restrictions upon it. In the first place it grants extralateral rights only on locations made on an outcrop and where a vein or lode has its top or edge exposed at or near the surface, and can be ascertained by ordinary surface exploration. Yet notwithstanding this, some of the critics of this bill concede that there remain few if any such locations that can possibly be made. In the second place the bill limits the extralateral rights to senior locations in all instances. In the third place a senior locator on the outcrop cannot enter the side lines of a junior location made one year or more after such senior location, unless the holder of such senior location is at the time of the making of the junior location diligently engaged in developing and operating his claim. In the fourth place, the senior locator must within two years work and mine out his vein through any junior location, or he must cause it to be located so that its existence may be known to the junior locator.

AS TO COMMISSIONS

"The friends of mining generally were disappointed and chagrined over the failure of the House Committee on Mines and Mining to grant their practically unanimous request for the appointment of a commission to make necessary investigations and report a revised bill for a new mining law. But this matter is now history, and in lieu of the commission the House Committee has introduced this bill looking to a complete revision of the mining laws. This bill has been subject to some very bitter criticisms. The editors of the leading mining periodicals have bombarded it with their heaviest centimeters. While this is the undoubted right of every editor as well as every private person interested in mining, yet it must be conceded that the style of criticism indulged in will not advance the mining interests. It is a matter of history that there was a commission appointed in 1879 to do in effect the work desired for the commission contemplated in the bill defeated by the House Committee on Mines and Mining. That commission was composed of distinguished persons supposed to have experience and a knowledge of the practical application of the mining laws. The commission, operating for something like a year, collected a vast amount of testimony which was published as a public document in a book of some 700 pages and contained also a tentative bill to be substituted for the existing mining laws. The bill proposed by that commission was evidently so far short of the requirements and so inferior to the existing law that it was never considered or introduced in Congress. The history of that commission and of its proposed mining bill is not calculated to inspire much confidence in commissions. However, criticisms of the existing mining laws continued and in fact increased both in quantity and virulence. But, strange to say of all these criticisms indulged in by mining periodicals, mining organizations, distinguished speakers and writers, no one in these 40 years has been bold enough to attempt to prepare a substitute bill. Of the numerous conventions of miners and mining bodies, none has ever authorized or even appointed a committee to draft a bill that might be offered as a substitute for the present mining laws. This committee bill is the first bill within a period of nearly 40 years that has even been prepared or offered to the public in any form as a proposed revision of the mining laws. This is in fact the first opportunity in a period of 44 years the mining industry has had to effect the desired revision of the mining laws. If this opportunity is to be lost by radical opposition, indefensible criticisms, bitter denunciation, and senseless opposition by different mining organizations, the mining industry will have itself to blame. The mining committee has in various ways sought to impress the idea upon the mining people that this bill was but tentative and intended as a rallying point around which the friends of the enterprise might meet and work out their salvation, not with fear and trembling, but in unity of purpose and with the single determination to work into this bill their desires and work out of it their objections. If they neglect this opportunity, they will pull down upon themselves their own doom and they can have no claim or right to be longer knocking at the door of Congress for relief."

(Continued from page 266

MINERS GIVE VIEWS ON REVISION OF LAWS

NOT ALTOGETHER OBJECTIONABLE

H. Stephens Ehrman, Pitkin, Colo. The present mining laws should be eliminated and something formulated that has a semblance of improvement and desirable. The Foster bill is not altogether objectionable. In my opinion as long as eastern men conduct the business for the western men there is little hope of prosperity. While I do not openly condemn eastern men in general, but simply say they are almost entirely ignorant of our needs and wants. This dickering with the mining laws and not killing the disease is a vagarism pure and simple. Restore silver to where it rightfully belongs and the solution is accomplished.

LETTERS TO DR. FOSTER

Chairman of Mines and Mining Committee Hears From Correspondents Regarding His Bill

Dr. Foster, the chairman of the Committee on Mines and Mining, has received, among many others, the following letters:

WANTS NO CHANGE

F. W. Bradley, Mine Operator, San Francisco. I have been an active mine operator for the last thirty years in California, Nevada, Oregon, Idaho, and Alaska, and am not at all in sympathy with the movement and agitation to revise the mining laws completely. I have partially learned the present rules of the game and do not care for any changes.

"FEARFUL AND WONDERFUL"

L. W. Trumball, State Geologist, Cheyenne. I wish to direct your attention to line 22 page 30, House Bill 12275. Wyoming has gas, potassium and sodium in the public lands within the state. If these are excepted from the placer list, they cannot be taken under any form of location, for they most certainly cannot be located under the lode law. Wyoming's area is still largely public land. We feel that we must protest against the prohibition of developing gas potash and soda production from public lands. It is especially desirable at the present time that an adequate supply of crude potash mineral be developed within the United States. To kill the incentive for prospecting and prohibit the development of such supply from public lands seems a "most fearful and wonderful" piece of legislation.

DIFFERS RADICALLY AS TO PROCEDURE

Robert I. Kerr, Secretary-Treasurer of the California Metal Producers' Association, San Francisco. This association appreciates your effort in endeavoring to reform our mining laws, but differs radically in the procedure adopted. Our objections thereto and recommendations in connection therewith are as follows:

Resolved, that, whereas, there has been introduced by Representative Foster in the House of Representatives, a bill (H. R. 12275) to revise, amend and codify the mining laws of the United States; and

Whereas, it is the sense of this association that this bill not only fails to remedy the existing defects in the present mining laws but, if adopted, will only tend to confuse and unsettle provisions which are, as a result of years of judicial exposition and practical experience, now comparatively well understood, and

Whereas, said bill attempts to regulate the minor details of locating mining claims, so that as a result the law would become far more complex and difficult to comply with, and without compensating advantages; and

Whereas, such an ill-considered change would be seriously prejudicial to the mining

Whereas, it is further the sense of this association that the mining laws should be simplified rather than further complicated, and that a special commission should be created by Congress for the purpose of giving detailed study to such laws in their relation to all the existing public lands laws, with the view to recommending legislation which shall be entirely harmonious with such land laws, and which, because of its clarity and simplicity shall result in the least possible amount of consequent litigation.

Now, therefore, the California Metal Producers' Association hereby enters its emphatic protest against the enactment by Congress of H. R. Bill No. 12275, or legislation of similar character, and strongly urges the enactment of a bill creating a commission for the purpose of preparing and presenting for adoption a thorough and harmonious and carefully considered mining code.

OBJECTS TO APEX LAW

W. H. Blackburn, Superintendent of the Tonopah Mining Company, of Tonopah. My great objection to House Bill No. 12275 is that it retains the old "discovery of mineral" and "extralateral right" propositions. These two propositions are just what all honest lawyers, experts, operators and owners of mines wish to see discarded in the location and perfection of title to Government lands and the rights granted after title or patent to metal mines is obtained. Out of ten producing mines in the Tonopah District, only two could show valuable mineral in place at the time their claim locations were made.

and then only on part of the claims that made up the original group. Since the time of location, valuable mineral has been discovered in all the locations of one company, but not in the other. The claims of the second company are valuable even without the discovery of mineral, and they should be allowed to hold them, provided they prosecute their search for minerals on some part of the group. Doing away with "discovery of mineral" and "extralateral right" in House Bill 12275 also does away with a considerable portion of the bill as a natural sequence. To limit the number of claims in any one mining district makes the annual assessment work required more rigid, the marking preservation of boundaries more elaborate, are desirable, but above all, we wish to see the apex law abolished. Many a time in my own experience have I seen thousands of dollars thrown away in proving the apex of a vein, the work done being of no use as a means of developing the mine or extracting ore after the cases are settled. Many companies with a common property line are entering into agreements not to exercise apex rights against each other. It is hoped that your committee will give the discussion by the Mining & Metallurgical Society of America, and other societies reported in Senate Document No. 233, earnest consideration, especially Resolution No. 3, page 42. The committee referred to could be limited in time, as there are many men already familiar with the whole subject from which to make a selection. The report referred to above covers the subject very thoroughly, and all the men quoted are experienced in apex legislation.

WANTS BILL KILLED

Jerome J. Day, President of the Tamarack & Custer Consolidated Mining Company, Wallace, Idaho. I have not given the entire bill my attention, and have confined my study to those sections dealing directly with metalliferous mining. I would not be competent to discuss, let alone criticize the methods, of handling the other subjects contained in the bill. I believe first that there has been too much hullabaloo over conditions that do not warrant a great deal of consideration, viz.: the apex question in mining. I have in mind the State of Idaho, which stands in the forerank of our mineral producing states, being second I believe, only to Missouri in the production of lead, and the cost of litigation upon the apex question in that district, compared to the volume of ore mined, and the value thereof is negligible. I believe it would be a mistake to attempt to put the mining industry upon a farming basis. Very little land suffices to make a very attractive mining proposition, and it should always be borne in mind that in locating and developing mineral ground, minerals are sought and ulterior motives should not be attached to that phase of our industrial life. It has been the writer's good fortune and financial gain to have been connected actively with the mining industry for the last twenty-five years, having worked in the deep mines of the Coeur d'Alenes, prospected throughout Idaho and British Columbia, and being interested in some of the heaviest development in Idaho at the present time, and identified with successful mining ventures, I would very much hesitate to change our mining law. In the criticism that I will make of the various sections, I want to say that there is no feeling in my expression other than to make myself plain upon the subject in hand. Taking up Section 2320 of the bill, covering the time allowed to make a permanent location, I believe that all of this section is unworkable for the following reasons: In the Rocky Mountain section of the United States we are all aware of the rigorous climatic conditions. It is very late in the spring or early summer before it is possible for a prospector to proceed with his undertaking. The early closing in of winter necessitates a very short season and he does not have to exceed four months out of every twelve in which to do this work. A cursory examination of the proposed method of the time limits does not take this condition into consideration, as he would lose his rights because of insufficient capital to finance himself through the winter, climatic conditions against his procuring supplies, equipment, men and accommodations, to withstand a long-drawn-out winter. The technical method of measurements is altogether too stringent. We must take into consideration that prospectors are not an educated class as a rule; in fact, a majority are men of little education, and to make the validity of a mining claim rest upon accurate measurements of the original locator, would be a blow to future development of our mineral resources not measurable at this time. For a strict compliance with this section, it would necessitate—in my mind—a man skilled in the surveyor's profession to comply with its demands. Taking up Section 2333-B, governing the extralateral rights of present owners of claims in controversy with proposed new or subsequent locations under this bill are totally impracticable, as no one familiar with the fissure veins of the Rocky Mountain section, and in particular the Coeur d'Alene lead district where veins have outcrops 5,000 or 6,000 feet vertical from the known lowest depths it would be impossible to survey or determine the true dip of these veins. The dip very often changes at different horizons, and no system of drilling has proven a success in this country; in fact, I am at present operating a mine that was abandoned because its drilling did not prove ore where the surveyor's tip showed it to be, illustrating very forcibly that the old adage of "follow the ore" is the proper method of mining, and not proceed with your development work to points where the ore should be, according to surveyor's notes. The method proposed for joint occupancy of mining tunnels is wholly impracticable, as no tunnel of my knowledge in the northwestern mining districts is of sufficient capacity to allow of two separate and distinct organizations using the same for mining operations. The length of time given as one year, to complete tunnel is also wholly inadequate. Taking districts of deep mining, where very often these tunnels must be driven anywhere from two to three miles in length to tap the ore bodies, would wholly preclude the possibility of putting this portion of the section into operation. It is not beyond physical demonstration to show that small mining companies or individuals work diligently, economically and industriously in the prosecution of their tunnels and take several years to complete the same. I have not dealt with any of the legal phases in my criticisms of this portion of the bill, nor will I do so. I have attempted to make the bill applicable to mining under my jurisdiction and the lightest criticism I can make of the same would be that they are totally inadequate in the main, not drawn up by men familiar with active mining operations, and probably little consulted, as even an examination by a novice would disclose glaring mistakes. I am firmly of the opinion that the bill is no improvement upon existing conditions. I am still further convinced that to enact this bill into law and attempt to apply it to the mining indusry of the United States, and especially to the Rocky Mountain District, which is in fact the mineral zone covered by the bill, would cause a stagnation of mining operations, and a total bar to future development work. Instead of making our laws more technical we should seek to simplify them, taking into consideration the topography of the country, geography, the intelligence and integrity of the people sought to be governed or guided thereby. I believe that if it were possible for your committee, or yourself, or any subcommittee to make a tour of the deep mines of Idaho, you would not for one moment hesitate to kill the bill, and I wish to extend to yourself, your committee or such persons as would represent you, an opportunity to visit the Coeur d'Alene district, and in particular the Hercules Mine, the Tamarack and Custer Mine and the Ray-Jefferson, at your convenience.

APEX LAW MUST GO

Richard Roelofs, General Manager The Cresson Consolidated Mining Co., Cripple Creek. I have read your bill. It is exceedingly involved, quite as abstruse as any other bill and will be productive of just as many lawsuits. Why you gentlemen cannot draft a bill and change the apex feature and do away with it entirely as is done in many countries is beyond my comprehension. No bill can be good with that law.

Courtenay DeKalb, Consulting Engineer, Tucson, Ariz. The recognition of "Mining Districts" and of organizations of miners seems to be perpetuating an archaic institution. Not only is it unnecessary, but it gives power to interested groups of men, operating under cover of Federal Statutes, to establish local regulations capable of producing hardship and of invalidating titles to mineral land. Local regulations of Mining Districts may be changed as often as desired by those interested in so doing, making it quite impossible to ascertain the rules governing points of vital import in the initiation and tenure of mining rights. The present bill seems deficient in respect to the initiation of rights of claimants to mineral land. "Reasonable diligence" is fruitful of litigation. What constitutes performance should be made specific. Furthermore, comparing the time limit of one year with the same principle running throughout the bill it would appear an unnecessary hardship to require a man who was in good faith searching for mineral to go into a local court to obtain a permit to continue for a longer period. The law should be considerate of a poor man who works with his own hands and who cannot command capital for speedy exploration. The requirements that a prospective claimant must readjust the original lines of his claim to conform to the strike of the vein within 30 days after ascertaining its direction, is certain to involve conflicts. Limitation of the number of claims which one individual or association may acquire, while democratic in principle, is out of accord with the conditions confronting the mineral development of the future. The day for limiting the area which a man might include in his scheme of investment was in the time when the rich deposits of a virgin country lay ready to reward the pioneer. Those wonderful bonanzas are now as rare as the osprey on the Jersey coast. Today we cherish the tailing piles which the early miners threw down the hillsides. Most commendable are the provisions of the bill for requiring patent within a limited period, and also for mandamus of the Land Office through resort to courts given jurisdiction over cases where patent had been denied under contestable circumstances. Record of locations with the nearest Land Office is also most desirable. These loom large as important reforms.

"DON'T RESTRICT PROSPECTOR"

B. A. Robison, Liberty, Colo. How is a prospector to determine just when he has discovered "the direction or strike of a vein?" Yet he must "immediately" upon such "discovery" measure his claim in length along the vein or lode discovered and within thirty days survey his claim and establish his monuments, including a post "where each end line crosses the vein or lode." It would be absolutely impossible to follow these provisions, even on one claim out of every hundred. Prospecting, at least by the poor man, on his own behalf, would end upon the enactment of such a law. The provision that "no person, persons, partnership, association or corporation shall hold, own or possess, or be interested in, either directly or indirectly, more than five unpatented mining claims" together with many other provisions of the bill, seem to be based upon the supposition that the prospector and locator locates and holds out of development and uses the mineral resources of the country through and by virtue of unpatented mining claims. No supposition could be entertained at further variance from the fact that this. A very little investigation of the matter would convince any person that it is not the owner of unpatented mining claims that is monopolizing the resources of the country and preventing their development, but that it is the owners and holders of patented lands, not only mining lands, but coal lands, city lands and all other kinds of valuable lands, that are doing that very thing. There are thousands upon thousands of illustrations within your own knowledge that will prove the truth of this statement. Don't restrict the prospector in the number of claims he may locate on his own behalf. As a general rule he will not locate and try to hold more than he can do the annual work upon. If he does try to hold more they are subject to location by another. He is the pioneer in the mining industry, and the pioneers in any country never monopolized the natural resources of the country. It is the land speculator that follows the pioneer who does that. Why is the word, "unpatented" incorporated in this bill? Why did not the provision include patented claims as well as unpatented ones? And why was the provisions of Section 2328K limited to "any locator?" It seems as though the locator is looked upon as the only offending party. Why did not the provisions of this section include the owner, whether he be the locator or not? The phrase "of sufficient value to justify permanent location and operation" if enacted, would greatly retard development. If such preventative laws had always been enforced in the world man would never have progressed. Bear in mind that the mineral bearing lands of the public domain are substantially worthless except for mining purposes and except, occasionally, they contain valuable timber. If the laws are not now sufficient to protect this timber from being stolen by the timber sharks by means of locating mining claims for the timber upon them, make them sufficient. But let the mining industry continue, either as a government enterprise of private industry. The two-year limit, provided in Section 2322b would substantially abolish the right of the owner of a claim in which a vein apexed to follow it through his side lines. Justice and fairness would be promoted if a workable law could and should be enacted, whereby the first discoverer of a vein, within the limits of his claim, no matter whether it be a junior or senior claim, would own it within his end lines and have the right to follow and mine it through his side lines, either down or up from his discovery and without reference to the claim in which it may apex. While this bill is full of restrictions upon the locator of mining claims, I find none whatever upon the owner of patented, or even unpatented claims, who has purchased them instead of locating them himself. I must say, from my way of looking at it, that the title of the bill does not express its real, workable provisions, however well intended, and I would suggest the title be changed to something like the following:

"To discourage prospectors, on their own behalf, upon the public domain and to encourage and enable wealthy land speculators, by means of United States Patents, to monopolize and hold out of use and development the greater portion of the mining lands of the United States and for a few minor purposes."

If your committee desires to curb the monopoly of the natural resources of the country and encourage and promote their development for the benefit of the people in general of the United States, I recommend that you secure the passage of a bill drafted along the lines so ably and clearly pointed out in the greatest gift man ever gave to man, "Progress and Poverty."

TUNGSTEN BRINGING $75 A UNIT IN BOULDER, COL., DISTRICT

The market for tungsten is at present extremely high owing to the great demand caused by the use of tungsten tools for turning out war steel.

The prices are so changeable that nothing very definite can be given but the latest reports reaching the U. S. Geological Survey are that $75 per unit (1 per cent of a short ton in tungsten trioxide WO_3) with a premium or 10 per cent is being paid for tungsten ores carrying 50 per cent or more WO in the Boulder region of Colorado. Again the matter of prices is largely one of individual bargaining and may be either higher or lower depending upon the needs of the buyer, the impurities in the ore, and the species. It is understood that lower prices are being paid for scheelite and hübnerite than for ferberite.

The extraction of tungsten ores as at present carried on is very similar to that of gold ores, *i.e.*, by crushing, sizing and running over shaking tables.

Current Federal Legislation

H. R. 406. Despite the urgent nature of this bill it still is pending on the Senate Calendar. The Committee attaches this importance to the bill:

"The committee wishes to emphasize the situation that practically all of the known lands of the Government containing phosphates, oil, gas, potassium, or sodium are, and for a number of years last past have been, withdrawn from all forms of location, entry, acquisition, or development; that this situation has continued over such a period of time that it has become almost a calamity to the regions within which these resources are situated, and the continued tying up of these resources is also of great detriment to the general welfare; that the situation at this time is of special urgency and critical importance; and the committee has, therefore, both as to the substance and detail of the proposed legislation, given many weeks of time and attention to the effort to place the legislation in clear and workable shape before the Senate.

"Therefore, prompt consideration and disposition of this legislation is urged in order that some legal and adequate method may be provided for the development of the national mineral resources and that, so far as relief contained in this bill is concerned, just and equitable treatment be accorded the citizen, without whose enterprise the Government would not have known the value of its own possessions."

H. R. 13842, by Mr. Wickersham. This bill provides for the establishment of a radio station at Seward, Alaska. An appropriation of $50,000, is asked to carry out the provisions of the bill.

H. R. 14126, by Mr. Bailey. This bill authorizes the Secretary of the Interior immediately to develop oil producing lands belonging to the public domain, and to make an appropriation therefor. The bill provides that the product be sold in open market, and the proceeds go into the Treasury of the United States. In the sale of the product, preference is to be given to independent refiners. An appropriation of $10,000,000 is asked.

H. R. 228, amending the United States Homestead law in its application to Alaska, has passed the House of Representatives and has been referred to the Senate Public Lands Committee.

H. R. 13917, by Mr. Steenerson. This bill amends the Act creating a Federal Trade Commission. It provides for the regulation of the wholesale prices of petroleum, gasoline, kerosene and fuel oil.

H. R. 13978, by Mr. Wickersham. This bill authorizes the people of Alaska to form a constitution and a State Government, and for the admission of the territory into the Union on an equal footing with the original States.

H. R. 10830 by Representative Foster, of Illinois. This bill provides for the uniform selection and purchase of fuel. It proposes to place in charge of the Bureau of Mines the determination as to the economical purpose and use of fuel purchased by the Government. As this involves the expenditure of hundreds of thousands of dollars annually considerable importance is attached to the bill. A subcommittee of the House Committee on Mines and Mining, of which Representative Moss, of Indiana, is chairman, is considering the bill and hearings have been held. The more important features of the hearing are treated elsewhere in this issue.

H. R. 15400, by Representative Hayes, of California. This bill provides for the leasing of unoccupied and unproductive public lands of the United States, the leasing of which there is no authority under existing laws. The bill was referred to the Committee on Public Lands and has not been acted upon.

H. R. 228 provides for amending the United States Homestead Law in its application to Alaska. The bill is now before the Committee on Public Lands of the Senate.

H. R. 15621, by Mr. Hayes, which provides for the purchasing of desert land by entrymen who cannot make final proof. This act is to take effect immediately. This matter has been referred to the Committee on Public Lands.

Amendment proposed by Mr. Smoot to the bill making appropriations for sundry civil expenses to enable the Secretary of the Interior to investigate the existence of artesian water and other underground water supplies suitable for irrigation in the arid and semi-arid portions of Southern Utah, $25,000

S. 5790 provides for the conferring of additional authority upon the President of the United States in the construction and operation of the Alaskan Railroad, and for other purposes. This bill has been referred to the Committee on Territories.

S. 6024, by Mr. Simmons. This bill authorizes the Secretary of Agriculture to permit the prospecting, development and utilization of the mineral resources of certain national forests. The bill was referred to the Committee on Mines and Mining.

S. 5716, by Mr. Pittman. This bill provides for the establishment of Mount McKinley National Park in the Territory of Alaska. This bill was referred to the Committee on Territories.

S. 5992, by Mr. Pittman. This bill authorizes the cutting of timber for mining purposes by corporations organized in one State and conducting mining operations in another. This bill has been referred to the Committee on Public Lands.

S. 5890, by Mr. Smith, of Arizona, to authorize mining for metalliferous minerals on Indian reservations in the State of Arizona. The provisions of this act do not apply to the Five Civilized Tribes and Osage Nation of Indians in Oklahoma. This bill has been referred to the Committee on Indian Affairs.

S. 5889, by Mr. Smith, of Arizona, granting water power sites on non-navigable streams to the States in which they are located. This bill has been referred to the Committee on Public Lands.

S. J. Res. 129, by Mr. Overman. This is a joint resolution extending until October 15, 1918, the effective date of section ten of the act entitled "An act to supplement existing laws against unlawful restraints and monopolies, and for other purposes," which was approved October 15, 1914.

PERSONALS

Dr. James E. Talmage, of Salt Lake City, Utah, a director of The American Mining Congress, spent several days in Washington last month, and conferred with Secretary Callbreath in regard to work of the organization.

J. R. Finlay addressed the Colorado School of Mines graduating class, at Golden, May 26, when he delivered the commencement address.

J. F. Callbreath, Secretary of the American Mining Congress returned to Washington late last month after a five weeks' western trip. His itinerary included Pittsburgh, Chicago, Kansas City, Joplin, Tulsa, Denver and Breckenridge, Colorado.

Falcon Joslin, of Seattle, Washington, and Fairbanks, Alaska, formerly a director of the Mining Congress, is again in the East, and is spending some little time in Washington, conferring with the Secretary of the Interior on Alaskan matters.

Hennen Jennings, of Washington, D. C., a former director of the American Mining Congress will sail from Seattle for Alaska June 20. Mr. Jennings is one of a committee of three to agree on the basis of the proposed amalgamation of the Treadwell mines.

The Secretary of the Mining Congress, Mr. Callbreath, addressed the graduating class of the Colorado School of Mines, at Breckenridge, Colo., May 4, on their annual outing for inspection of mines and mining operations.

W. R. Ingalls addressed the School of Mining and Metallurgy, Rolla, Mo., at their commencement exercises, May 26.

David White, chief geologist of the Geological Survey, made a professional trip to the Clearfield district of Pennsylvania recently.

G. B. Richardson, of the Geological Survey, has resumed work on the Butler, Pa., quadrangle.

E. S. Bastin of the Geological Survey is visiting a number of American graphite properties.

W. C. Alden, the geologist in charge of the section of glacial geology of the United States Geological Survey, is on a professional trip to Pennsylvania.

R. V. A. Mills, of the United States Geological Survey, has returned from Ohio, where he made a short professional visit.

G. H. Dowell, of the Copper Queen Consolidated Mining Company of Bisbee, Arizona, who has been spending some little time in the East, on his return trip stopped at Washington and was a caller at the American Mining Congress office, where he discussed the Arizona State Chapter activities and expressed his appreciation of the MINING CONGRESS JOURNAL.

E. C. Eckel, a well-known authority on cement and iron ore, formerly with the Geological Survey, is in attendance at the Fort Oglethorpe military camp.

FIGHT ON HOOKWORM BEING MADE IN CALIFORNIA

Progress is being made on the preliminary investigation of hookworm among miners in California. This work is being conducted jointly by the Bureau of Mines and the State. It has been found that in certain camps there is a high percentage of hookworm cases. As high as 40 per cent of the men in some camps have been found to be sufferers.

It has been found that the persons attacked are almost entirely engaged in underground work, where dampness allows the germ to thrive and where opportunities for contact with it are greater than on the surface.

J. H. White, sanitary engineer of the Bureau, is representing the Bureau of Mines in this work.

Tungsten Higher in America

The English Government has a fixed price for tungsten ores. The English price is, however, much below the market price in America.

Brings $1 a Pound

The last offer known to the U. S. Geological Survey was $1 a pound for molybdenite carrying 50 per cent molybdenum sulphide, with a small premium for higher percentages and a corresponding penalty for lower percentages.

Latest Mining Patents

Miner's Safety Lamp. No. 1,181,012. This invention is by Steve Starcevich, of Ronald, Wash.

This invention relates to improvements in miners' lamps of the safety type and has for its primary object to provide an attachment for a suitable lamp structure so that a more effective lighting thereof is provided and access to the parts made easier. Another object of the invention is to provide novel reflecting means to be attached to a suitable lamp structure and which serves to provide an effective illumination of the lamp. Another object is to improve generally the lamp structure of the character described so as to render it more practical, reliable and efficient in operation and inexpensive in manufacture.

Flotation of Minerals. No. 1,180,816. This invention is by Raymond F. Bacon, of Pittsburgh, Pa., assignor, by Mesne Assignments, to Metals Recovery Company of Maine.

This invention relates to a method for effecting the flotation and separation of oxidized ores from the gangue with which they are associated, by first converting the oxidized ores, in a finely divided condition, into sulphides by the action of a soluble sulphide, such as hydrogen sulphide, and then subjecting the ore to any of the familiar processes for effecting the separation of sulphides from gangue.

Process of Treating Ores Bearing Precious Metals. No 1,181,177. This invention is by Edward R. Holden, of Los Angeles, Cal.

This invention relates to an improved process of treating ores electrolytically.

Mr. Holden treats ores containing gold and silver in a solution for dissolving the gold and silver. The improvement consists in producing a rotary motion in the solution and at the same time subjecting the ore and solution to an electrolytic action and to the action of a cathode coated with mercury, and after a predetermined time, gradually reducing the level of the liquid from the top downward, while continuing the rotary motion of the liquid.

Art of Agglomerating Ores. No 1,181,244. This invention is by James H. Payne, of Baltimore, Md.

This invention relates to the agglomeration of ores, concentrates, mattes and the like, and has special reference to the treatment of such materials containing large quantities of sulphur in the form of sulphides. The ores, matter or concentrates treated may contain sulphides of copper, lead, zinc or other metals. This invention includes the retention within the product of substantially the entire amount of the fixed sulphur.

Process of Roasting Zinc-Blende. No 1,183,172. This invention is by Charles A. H. de Saulles, of New York.

This invention relates to a method of treating zinc blende for recovering metallic zinc, which comprises roasting the blende, adding carbon to the roasting charge at the latter end of the roasting operation and regulating the air admission so as to produce a temperature not exceeding 1,000° C., and thereby obtaining a reduction and dissociation of the sulphates present without violating any of the metals, and finally treating the resultant roast in a suitable furnace to reduce the zinc to a metallic state.

Mine Lamp. No. 1,183,147. This invention is by William McKean White and Everton C. Brommer, of Indianapolis, Ind., assignors, by Mesne Assignments, to Electric Service Supplies Company, of Philadelphia, Pa.

The object of this invention is to provide a headlight construction particularly applicable for mine locomotives which usually have rather rough traveling, wherein the jarring of the source of illumination and of the reflector is in a large part avoided.

A reflector, preferably glass, and a source of illumination, preferably an incandescent lamp, is mounted in a suitable frame or casing which is in turn mounted on an outer frame or casing by a spring mounting. Preferably, this spring mounting includes a number of radial springs, preferably under tension, and one or more leaf springs which bear against the back of the inner casing.

Dry Ore Separator. No. 1,193,226. This invention is by David M. Owings, of Canton, and William R. Kinsey, of Bartlesville, Okla.

It relates to improvements in ore concentrators and more particularly to that class known as dry separators.

The object is to construct an apparatus of this character that the ore containing sand will be loosened and retained in loosened condition rendering it impossible for the heavier metal particles to settle at the bottom of the separator. Another object is to provide an apparatus of this character with an air blast passing through and with a plurality of agitators some of which are rotated in one direction and with the blast and some in the opposite direction against the blast to prevent the escape of any metal particles and cause them to settle in channels in the table of the separator.

Fluid-Pressure-Operating Mechanism. No. 1,183,275. This invention is by Omar C. Clark, of Denver, Colo., Assignor to the Denver Drill Manufacturing Co., of Denver, Colo.

This invention relates more particularly to means for lubricating pneumatic tools and the like, and more especially those employed in rock drills. In that type of rock drills wherein automatic means is provided for effecting the rotation of the drill bit, considerable difficulty has been experienced in lubricating the rotating mechanism.

One of the objects of this invention is to provide simple mechanism of an automatic character that depends for operation on the pulsation or rise and fall in the fluid pressure due to the actuation of the motor, and furthermore results in the vaporization of the lubricant, and its even distribution to all the working parts and particularly the rotating mechanism.

Rock Drill. No. 1,183,274. This invention is by Omar E. Clark, of Denver, Colo., Assignor to the Denver Rock Drill Manufacturing Co., of Denver, Colo.

It relates to rock drills, in which means are provided for delivering a cleansing agent to the bore of the drill bit, and thus to the bottom of the drill hole for removing the cuttings from the latter.

One of the principal objects is to provide a novel and effective mechanism for supplying both a liquid and a gaseous cleansing agent, either or both of which may be used as desired.

Stable Alkaline Solutions Containing Active Oxygen. No. 1,181,410. This invention is by Alois Schaidhauf, of Frankfort-on-the-Main, Germany, Asignor to Roessler and Hasslacher Chemical Company, of New York, N. Y.

This invention relates to alkaline solutions containing active oxygen and has for its object to preserve the efficiency of such solutions.

Other patents issued during the past month are as follows:

No. 1,180,840, process of producing aluminum, George Giuline, Como, Italy. No. 1,180,844, process of extracting copper from its ores, W. E. Greenawalt, Denver, Colo. No. 14,121, coal washing jig, C. A. Wendell, Joliet, Ill. No. 1,180,435, process of recovering metals, C. S. Robison, assignor to the Metallic Smelting and Refining Co., Chicago, Ill. No. 1,180,765, extraction of zinc from its ores or products, H. T. Durant, assignor to the Metals Extraction Corp., London, Eng. No. 1,182,951, process of desulphurizing ores, H. F. Wierum, Upper Montclair, N. J., assignor to the Sulphur Syndicate, Limited, London, Eng. No. 1,182,893, melting furnace, A. W. Carroll, Elizabeth, N. J. No. 1,183,057, apparatus for preventing overwinding at collieries and mines, W. H. Ashton, Wigan, Eng. No. 1,183,086, process of cyaniding, H. R. Layng, Seneca, Calif. No. 1,183,102, mining machine moving and holding device, E. C. Morgan, Morgan Park, Ill. No. 1,183,153, acid reclaiming apparatus for sulphite mills, G. S. Witham, Sr., Hudson Falls, and J. J. McEwen, Fort Edward, N. Y. No. 1,183,252, container for precious stones, A. J. Sterne, Bronxville, N. Y. No. 1,181,192, roasting of sulphur-bearing ores, H. H. Stout, assignor to the General Chemical Co., New York City. No. 1,181,184, roasting furnace for sulphur-bearing ores, H. H. Stout, assignor to the General Chemical Co., New York City. No. 1,181,666, ore separator, E. R. Holden, New York City. No. 1,182,890, separation of metallic fluids, L. Bradford, Boken Hill, New South Wales, Australia. No. 1,182,909, amalgam mixer, Gustav Holtz, Gouldsboro, Pa. No. 1,182,915, process of recovering elemental sulphur from sulphur gases, W. F. Lomoreaux, Isabella, Tenn. No. 1,182,953, mine check holder, W. A. Williams, Barton, Ohio. No. 1,183,275, fluid pressure operating mechanism, O. E. Clark, assignor to the Denver Rock Drill Co., Denver, Colo. No. 1,183,441, mechanism for operating coal augers, T. W. Davis, Hanaker, Va. No. 1,183,736, process for refining copper, E. C. King, Cananea, Mex.

INCREASED FLUORSPAR PRODUCTION BRINGS MUCH HIGHER PRICES

The total quantity of domestic fluorspar reported to the Geological Survey as sold in 1915 was 136,941 short tons, valued at $764,475, an increase in quantity of 41,825 short tons and in value of $194,434, representing nearly 44 per cent of the quantity and about 34 per cent of the value of the product marketed in 1914. The average price per ton for the whole country, all grades of fluorspar, gravel, lump, and ground considered, was approximately $5.58 in 1915, compared with $5.99 in 1914, a decrease of nearly 7 per cent. This value represents the selling price on board cars or barges at railroad or water shipping points; and with reference to the product from Colorado, New Mexico and New Hampshire, the price reported for much of the spar includes the cost of a long wagon haul—$1.50 to $3 a ton. In Illinois the principal producing mines are near river transportation and many of the mines reporting from Kentucky are near a railroad, so that the cost of long wagon hauls has not entered to an important extent into the reported value of the fluorspar from those States.

PEACEFUL NEGOTIATIONS NET MORE THAN GENERAL STRIKE

Washington Star.

An agreement has been effected between the anthracite coal operators and miners which averts a strike in the hard coal district and insures peace in the production of that commodity for four years. Negotiations over the demands of the operatives for recognition of the union have been pending for some time and were wisely continued over the month of April, although the old contract expired on the first of that month. The successful outcome of the dealings in New York illustrates the wisdom of an extension provision in every labor contract to provide for continued production pending adjustments.

Under the new agreement, which is to run for four years, instead of three as in the past, the union is recognized, but the "check off," by which the companies were to be required to collect the union dues from the workers, is not granted. This "check off" demand is perennially made, but is regarded actually as a trading element, for it is not to be expected that the operators would agree to finance the union organization and enable it to accumulate a strike fund with which to conduct warfare in the future. The most substantial material gain is that the men are granted a wage increase which averages 10 per cent, with a reduction of working hours to eight. This means that the operators will pay more at the mine for the production of coal than before, in a sum estimated at between $10,000,000 and $12,000,000 annually.

Naturally the bulk of this difference will fall upon the consumer. It is not to be expected that the additional cost of production will be borne by the mining companies. The additional wages, both in terms of daily scale and hours, will add to the tonnage cost at the mine, and it is now estimated that the retail price will be advanced about 40 cents a ton. This, however, is better in the immediate situation than a complete stoppage of coal production for a protracted period, as in the great strike of 1902, when the country was tied up for more than six months without hard coal and a condition of extreme severity was the result. It is encouraging to find that adjustments can be effected without strikes in the hard coal district. The brief strike of three years ago yielded less of advantage to the miners than the present peaceful negotiations.

BUREAU OF MINES RULES ON QUESTION CONCERNING PATENTS

Considerable question has come up in Government departments as to the rights of employes to patent inventions in their own names when they are developed, at least in part, on Government time and with Government facilities.

The Bureau of Mines has been called upon, within the last few weeks, to make a decision with regard to this question and has ruled as follows:

"The Bureau of Mines takes the position that the domestic rights in patents resulting from office work while in the employ of the United States to be the property of the United States.

"Some patents have been taken out in the name of the public, but the bureau believes that patents involving complex problems, where improvements may have great value, should be assigned to some Government official for the public, who can issue licenses regarding patentable improvements to be similarly assigned."

GEORGIA LEADS ALL STATES IN PRODUCTION OF ASBESTOS

Georgia produces far more asbestos than any other State. The asbestos is of the amphibole variety and of the mass-fiber type in which 90 per cent of the rock quarried appears in the finished product; it can therefore be produced at much lower cost than other asbestos. It is all ground and fiberized to practically one grade, suitable for the manufacture of cements, plasters, shingles, and asbestos lumber. There are two companies operating, the Sall Mountain Co., of Chicago, with mine near Cleveland and mill at Gainesville, Ga., and the Asbestos Mining & Manufacturing Co., of Atlanta, Ga., with its mine and mill at Hollywood.

DEPRESSION IN SLATE INDUSTRY CONTINUED THROUGH 1915

The depression which began to affect the slate industry in October, 1914, continued throughout the greater part of 1915, and the total value of slate sold in the latter year decreased 13 per cent, says the U. S. Geological Survey. For the first time since 1901 the total value of slate sold fell below $5,000,000. Roofing slate decreased 5 per cent in quantity and 10 per cent in value. For the first time since 1898 the number of squares sold was less than 1,000,000, and for the first time since 1900 their value fell below $4,000,000. Mill stock decreased nearly 15 per cent in quantity and 17 per cent in value, the lowest value since 1908. Blackboard material and school slates ("other uses") decreased nearly 31 per cent.

Map Plattsburg Area.

In cooperation with the War Department the United States Geological Survey has issued a special edition of seven maps covering areas in the vicinity of Plattsburg, N. Y.

TAKES EXCEPTION TO ARTICLE WRITTEN BY KENTUCKY MAN

Frank J. Hayes, vice-president of the United Mine Workers of America, has sent the following letter to the American Mining Congress:

"Relative to an article of S. A. Driver, of Kitts, Ky., in THE MINING CONGRESS JOURNAL, I beg to advise that Mr. Driver seems to have no knowledge of the efforts put forth by our organization to promote safety in the mines of this country. The United Mine Workers of America has always been a strong and consistent supporter of the 'Safety First' program. We have upheld the discipline of our members on numerous occasions for violations of safety rules. Statistics show that the loss of life is about three times greater in the non-union mines than it is in the union mines. This ought to be proof positive that the United Mine Workers of America is one of the greatest agencies in the country today for the promotion of safety in mines.

"It is true a number of accidents in mines are caused by carelessness—carelessness of both miner and operator. Neither side can be held solely responsible for mine accidents.

"I agree with Mr. Driver that a vigorous campaign of education should be waged, having for its purpose the education of every miner along the lines suggested."

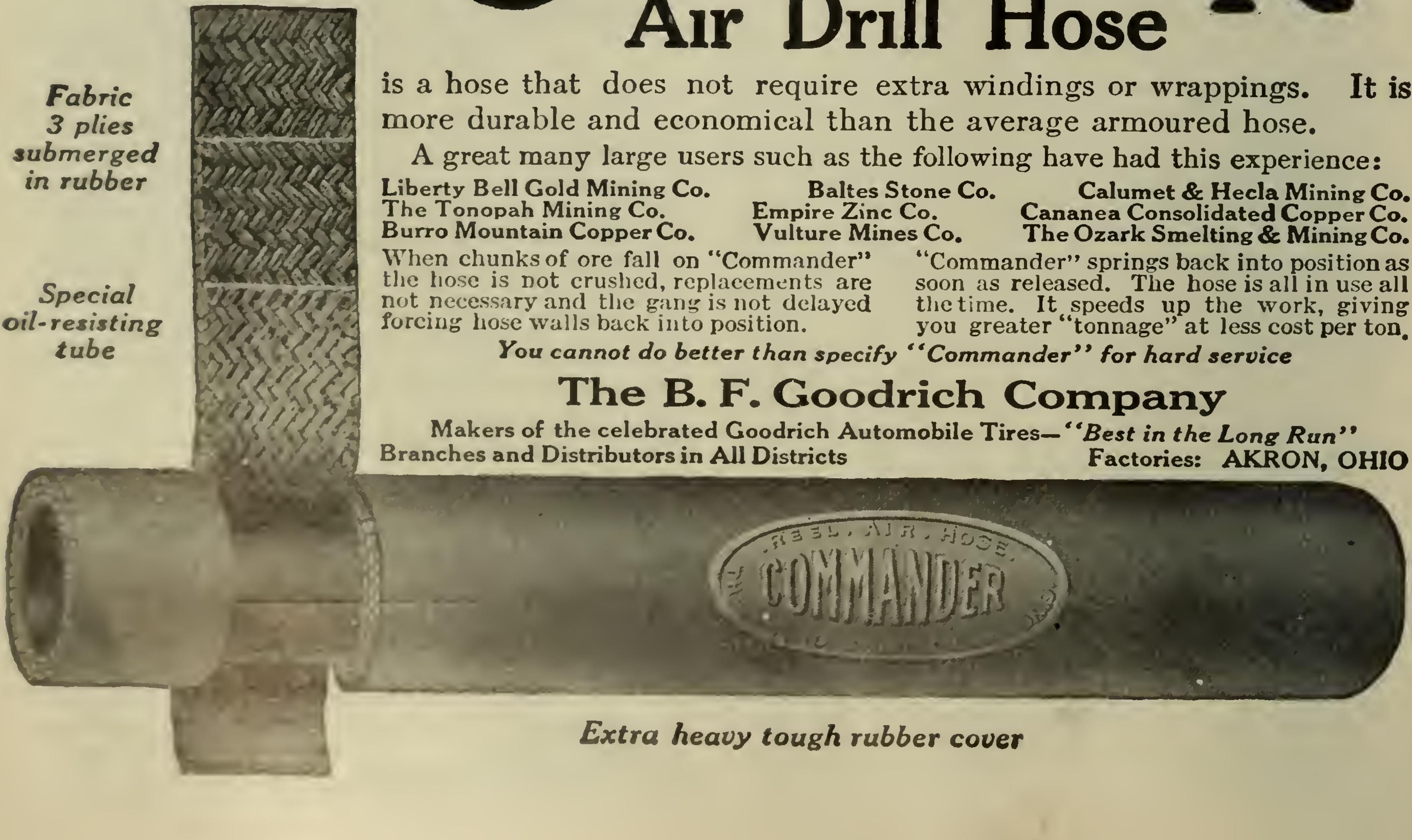
DENVER QUARTZ MILLS
AND DENVER STEEL CRUSHERS
have that kind of reliability that constantly and continuously keeps on being reliable.
The Denver Quartz Mill & Crusher Co.
216-17 Colorado Bldg., Denver, Colo., U.S.A.

Facts as to Scheelite

Scheelite (calcium tungstate) crystallizes in the tetragonal system, has a hardness about that of calcite (4.5 to 5.), and a specific gravity of about 6. It has a vitreous luster. The occurrence of scheelite is almost the same as that of hübnerite, wolframite and ferberite, but it is found in contact deposits in which the others are apparently unknown.

No Jackets—No Armour

Not in this case **COMMANDER Air Drill Hose**


Fabric 3 plies submerged in rubber
Special oil-resisting tube
REEL AIR HOSE
COMMANDER
Extra heavy tough rubber cover

is a hose that does not require extra windings or wrappings. It is more durable and economical than the average armoured hose.

A great many large users such as the following have had this experience:

Liberty Bell Gold Mining Co.
The Tonopah Mining Co.
Burro Mountain Copper Co.
Baltes Stone Co.
Empire Zinc Co.
Vulture Mines Co.
Calumet & Hecla Mining Co.
Cananea Consolidated Copper Co.
The Ozark Smelting & Mining Co.

When chunks of ore fall on "Commander" the hose is not crushed, replacements are not necessary and the gang is not delayed forcing hose walls back into position. "Commander" springs back into position as soon as released. The hose is all in use all the time. It speeds up the work, giving you greater "tonnage" at less cost per ton.

You cannot do better than specify "Commander" for hard service

The B. F. Goodrich Company
Makers of the celebrated Goodrich Automobile Tires—*"Best in the Long Run"*
Branches and Distributors in All Districts
Factories: AKRON, OHIO

THE MINING CONGRESS JOURNAL

LIBRARY
JUL 12 1916
UNIVERSITY OF TORONTO

SAFETY—EFFICIENCY—CONSERVATION

VOL. II

No. 7

JULY, 1916

H. D. McCaskey
Chief, Mineral Resources, U. S. Geological Survey
(See sketch on page [illegible])

PUBLISHED BY
THE AMERICAN MINING CONGRESS
PUBLICATION OFFICE
MUNSEY BUILDING WASHINGTON, D. C.

$ 2.00 PER YEAR 20 ¢ PER COPY

The last belt to give out

Equal lengths of three different makes of new conveyor belt were fastened together at the ends and installed as one belt, by a well known colliery on December 3, 1912, to establish relative belt merits.

A positive test—as stress, load, character of materials and other operating conditions were absolutely identical. When one brand, or one-third of the belt, gave out it was replaced, the record kept, the cost computed and the other brands, or other two-thirds of the original, left in service until likewise rendered useless. Quality was the backbone of cost per ton figures, without question.

	Cost per foot	Cost per ton handled
Goodrich "Longlife"	4.56	.00041
Competitor No. 1	3.49	.00045
Competitor No. 2	5.47	.00063

GOODRICH
"Longlife" Conveyor Belt

gave the lowest cost per ton, proving two things: First—A cheap belt is expensive in the end.

Second—Goodrich belts are neither high nor low in first cost, but are built of materials for the service that gives you a minimum cost per ton.

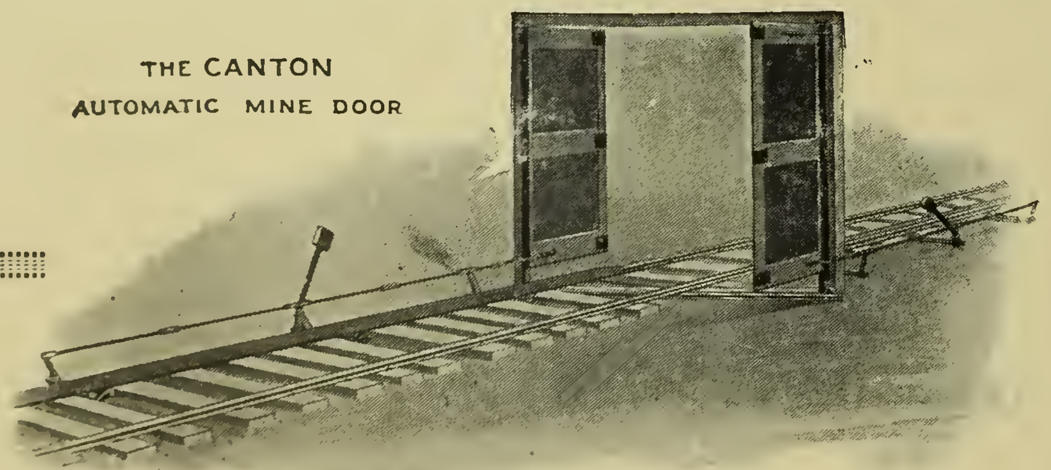
Try Goodrich for fewer shut-downs, less maintenance expense and greater tonnage.

he B. F. Goodrich Company
Makers of the Celebrated Goodrich Automobile
Tires—*"Best in the Long Run"*

ctories:
kron, Ohio

Branches and Distributors
in All Districts

THE CANTON
AUTOMATIC MINE DOOR



IMPROVED METHODS
Without Additional Expense

IF you contend for old time methods, you might try keeping time by employing a boy with a hammer and gong, to strike off the hours as indicated by a sun dial. ¶ A trial, however, will convince you that a good clock is cheaper and more reliable. ¶ So is the Canton Automatic Mine Door better than a trapper boy. ¶ Write for literature.

THE AMERICAN MINE DOOR COMPANY, Canton, Ohio

VOL. 2, NO. 7 WASHINGTON JULY, 1916

THE MINING CONGRESS JOURNAL

Official Organ of the American Mining Congress

OVER 500,000,000 TONS OF BITUMINOUS COAL WILL BE MINED IN U. S. IN 1916

Estimate Made by Geological Survey Places Current Year Production High Above Any Previous Record—First Six Months of 1916 Show Remarkable Coal Production, to Which Every Producing State Contributed an Increase

The output of bituminous coal in the United States during the first six months of 1916 was the greatest ever recorded in any half-year period. Estimates by C. E. Lesher, of the United States Geological Survey, based on returns from over 100 railroads originating coal and coke shipments, indicate that the production during this period was 261,000,000 tons, an increase of 35 per cent over the first six months of 1915, and of 5 per cent over the last six months of the same year, and greater by several million tons than the record established in the last half of 1913.

Compared with the first half of 1915 the exports from the Atlantic seaboard during the last six months have increased about 10 per cent, and the exports to Canada have nearly doubled. The movement of bituminous coal through the Soo Canal on the Great Lakes shows an increase of 80 per cent, and the coal used in coking has increased nearly half. Increased consumption by railroads and by the iron and steel and nearly all other industries has been a large factor in establishing this record.

From April, 1915, to January of the present year the production of bituminous coal increased at a rapid rate, with but temporary slackening in November and December due to car shortage. The output in January, 1916, was more than 60 per cent greater than in April, 1915, and the production in February and March, 1916, was nearly as great. Many large users of coal laid in stocks of fuel in anticipation of a possible shut-down at the mines in April because of labor troubles, and though there was no general strike, the production in April declined greatly as a result of decreased buying on the part of those having stored coal to use. May and June, however, showed successive increases, and there is every indication that the production during the coming six months will equal if not exceed the six months just past, and that the output in the calendar year 1916 will exceed 500,000,000 tons, establishing a new record for bituminous coal.

Every coal-producing State from Washington to the Atlantic coast has shared in this general increase.

The output of beehive coke has increased from about 11,250,000 tons in the first half of 1915 and 16,250,000 tons in the second half of 1915 to more than 18,000,000 tons during the last six months. The manufacture of coke in by-product ovens has also increased as new ovens have been completed and put in commission.

The production of Pennsylvania anthracite increased about 3 per cent over the corresponding period in 1915.

TEXAS INCREASES ITS OUTPUT OF WHITE METAL

The United States Geological Survey reports that the Presidio silver mine of Texas was in continuous operation during the first six months of 1916, and that mining was also carried on actively during that period in the Van Horn and Sierra Blanca districts, all in the trans-Pecos country. The net result was a small output of copper, lead, and zinc, but a production of silver for the six months of fully 310,000 ounces.

As this issue of the JOURNAL goes to press the Sundry Civil bill, carrying the appropriations for three of the mine experiment stations authorized at the last session of Congress, is in conference. There is no probability of the rejection of the item providing for the three experiment stations.

Following the signing of the bill by the President Secretary Lane will designate the points at which the new stations are to be located. While no intimation can be obtained of the places Mr. Lane has in mind it is understood that one will be in the southwest, one in the northwest and one in Alaska.

COMMISSIONER HURLEY TALKS TO OPERATORS IN PITTSBURGH

More than 150 operators from eastern Ohio, the Hocking Valley, and western Pennsylvania, Greensburg, Westmoreland, and central Pennsylvania districts met in Pittsburgh last month and listened to Edward N. Hurley, of the Federal Trade Commission.

Mr. Hurley made a straightforward statement to the effect that the Commission is willing to study conditions if the operators will give it the necessary data. After securing it, such recommendations as possible will be made.

The Commission is making up a set of questions which will be sent to each of the operators. When the replies are received they will be tabulated and a study made of them. The Commission will try to work out some solution to be presented to Congress.

One of the things Mr. Hurley emphasized strongly was the question of uniform accounting. It is very evident that the Mining Congress Committee, of which S. A. Taylor, is chairman, which has been working on this matter for some time and has had a number of meetings with Mr. Hurley, is achieving success. The disposition manifested in the meeting was one of hearty cooperation.

MINING MAN HAVING HIS INNINGS, SAYS GEO. OTIS SMITH

"The accomplishment of the mining industry in the six-month period just completed warrants the forecast that 1916 is to be a record-breaking year." With this statement Geo. Otis Smith, the Director of the United States Geological Survey, sums up his official mid-year review of the mineral industry as reported to him by the Government geologists and statisticians covering the different subjects. 'Active demands and good prices have furnished the mine operators with full opportunity for success in working developed properties, and this in turn has given added incentive and available funds for exploration, prospecting, and experimentation with new processes. The mining man is having his innings."

COPPER OUTPUT IN ALASKA WILL EXCEED ALL RECORDS

The Alaska mining industry will have a very prosperous year in 1916, according to a statement by Alfred H. Brooks, of the United States Geological Survey, covering the operations during the first six months of the year. Copper mining will probably show the greatest advances. About fifteen Alaska copper mines are now shipping ore, and developments are being pushed on others, indicating that they may become producers before the end of the year. There is every reason to believe, therefore, that the Alaska copper output for 1916 will be greater than that for any previous year.

The gold lode mines of Alaska will make a larger production this year than last, but it is not now expected that the placer-mining industry of Alaska will show any marked increase.

The shipment of antimony from Alaska is continuing, and some tungsten ores have already been shipped form the Fairbanks district.

SECRETARY LANE ORDERS MID-YEAR REPORTS CONTINUED

"The mid-year review was so well received last July," said Secretary Lane, "that I believe it met a public need, and it will therefore be continued as one of the services rendered to the public by the Interior Department. The business of the whole country has become so interdependent that facts regarding our mines and mills and furnaces are of real concern to every citizen interested in any industrial undertaking. That the mining industry is making many new records in the extent and success of its business must be taken as an index of the nation's general prosperity. Best of all, 1916 is registering another advance in the growing independence of the United States as a producer of the many materials that civilization has made necessary. Our country is coming into its own."

HOMESTAKE PRODUCES NEARLY $4,000,000 IN HALF YEAR

The Homestake mines and mills and the other smaller mills in the Black Hills, South Dakota, have been operated continuously, according to reports received by the United States Geological Survey, producing approximately $2,700,000 in gold for the first six months of 1916.

Dynamite Prices Soar

As a result of abnormally increased use of sulphuric and nitric acid and because of the shutting off of the supply of glycerin from Europe, the cost of manufacturing dynamite of all grades, but especially those containing a high glycerin content, has been largely increased recently. In fact, the cost of straight nitroglycerin dynamites has practically doubled and even the ammonia dynamites have increased greatly in cost.

COPPER PRODUCTION DURING FIRST SIX MONTHS OF 1916 EXCEEDS ALL RECORDS

With an Average Price of Twenty-Six Cents a Pound American Mines Disgorge Themselves of Immense Tonnage of Red Metal—Output of Blister Copper Approaches Two Billion Pounds—Output Sold Many Months Ahead

Under the influence of large demands and resultant high prices the production of copper during the last six months has exceeded that of any equal period in the history of the industry.

The United States Geological Survey states that there has been a steady rate of increase in the output since early in 1915. The production during the last half of 1915 considerably exceeded that of the first half, according to the report by B. S. Butler, of the Geological Survey, and during the year the refineries produced, from both domestic and foreign ores, a total of 1,634,000,000 pounds of blister copper, of which 1,388,009,527 pounds was produced from ores mined in the United States.

The price for the period has averaged above the highest price received for copper at any time in recent years, the average for the first six months of 1916 being more than 26 cents a pound. The cost has doubtless increased slightly, as the important copper companies have increased the wages of their employes, but this increase has been largely offset by decrease in cost due to working plants at the maximum capacity. Many small mines are operating that could not be profitably worked under normal conditions and this, of course, tends to increase the average cost per pound.

The profits of the producing companies have been large and as much of the output is sold several months ahead of delivery the prosperity of the industry is well assured for the remainder of the year, so that 1916 will doubtless be the most profitable year in the history of copper production to the present time.

OLD SILVER CAMPS REALIZING ON MANGANESE ORES

All grades of manganese ores are in great demand. Prices are higher than they have been for thirty years. Good grades of manganese containing forty to fifty per cent manganese and more than one per cent of iron, are now worth in the eastern markets $25 to $35 per ton. High grade ores containing fifty per cent or more of manganese and less than one per cent of iron, such as are adapted to the manufacture of dry batteries and flint glass, are bringing $85 to $100 per ton.

A number of the old silver mining camps in the ore of which a considerable amount of manganese dioxide is found, are being searched carefully for high-grade manganese ores and a considerable production is being developed. Principal among these camps are Pioche, Nevada; Tombstone, Arizona, and Leadville, Colorado.

While these camps are producing the greater amounts of manganese at present, many of the smaller camps are making important contributions to the supply of manganese ores. According to geologists here, who are intimately familiar with many of the western mining camps, many of these districts possess manganese ores which, with proper care and sorting, would stand the expense of shipment to points east of the Mississippi River.

Many new deposits have been reported to the Geological Survey during the past year, but the greater portion of these apparently are not capable of producing ores containing less than one per cent iron. It is for this character of ore that the demand is the greatest. There is every reason to believe that the shortage of manganese ore will continue until an outlet for the Russian ore is secured.

ALABAMA MINE SAFETY ASS'N. PRAISED BY H. M. WOLFLIN

The work done at the recent field meet of the Alabama Mine Safety Association is declared by H. M. Wolflin, safety engineer of the Bureau of Mines, to have been the most excellent State meet that he has attended this year. He was very much impressed with the work that has been done by the Alabama association, and is very much pleased with the efficiency of the teams. The interest of the public in this movement is attested, Mr. Wolflin stated, by the very large attendance at the meet.

GEOLOGIST SENT TO UTAH IN REPLY TO PETITION

In reply to a petition by the Utah Chapter of the American Mining Congress, George Otis Smith, Director of the Geological Survey, has sent B. S. Butler, of the Survey's staff, to the Cottonwood-American Fork District of Utah to make a detailed examination of the region in which the present mining activity is in progress.

PAIGE SUGGESTS HYPOTHESIS AS TO ORIGIN OF ORE BODY AT GREAT HOMESTAKE MINE

Sidney Paige, one of the few government geologists who have been permitted to enter the Homestake mine at Lead, S. Dak., suggests the hypothesis that the Homestake ore body is *in the main* a replacement deposit in a calcareous slate series and that it owes its position to the presence of a strong fault and its form to its replacement character and to structural factors. He describes the position and form of the ore body as follows:

The form and position of the surface croppings of the Homestake ore body may be gathered from a study of the open cuts. It is observed that there are two parts: a wide part, that to the south (the great open cut at Lead), and a narrow part, that to the north, terminating in the De Smet cut on the southern rim of Deadwood Creek.

The narrow portion begins to spread and merge into the wide portion at a point where stratigraphic work indicates the presence of the main body of the calcareous series. The narrow portion appears to be a single calcareous bed thrown into a sharp fold well exposed as a narrow synclinal trough in the northern end of the De Smet cut.

The western boundary of these surface exposures is a relatively straight line and is believed to be, for reasons already set forth, a fault-plane.

The outcrop of the Caledonia ore body has been shown to coincide very nearly with the outcrop of a part of the calcareous series. The strike is directly toward the main Homestake ore body; in fact, a portion of the two open cuts are very close together.

Beneath the surface the form and position of the ore body is even more significant. The wider portion, on a given level, is delimited in certain definite ways. First, on the western or footwall side by a relatively straight line—the fault-line; second on its southern end by a number of narrow fingers, which examinations show to be actual folds—that is, the ore is sharply cut off by wall rock which curves around it; and, third, on the north-northeastern side—that is, in the direction of strike of the rock series—by indefinite fading away of ore. The inference is that here a definite series of beds striking north-northeast has been folded, cut off by a fault, and mineralized.

The ore body plunges in the direction of the intersection of the fault-plane with the steeply dipping beds, and at each succeeding level is capped by a greater thickness of barren rock. The Caledonia ore body pitches with the dip—that is, the replaced beds are cut by no fault-plane. Its northern extension is taken to be limited by the distance from the fault-plane that solutions were able to replace limestone, its southern extension by late igneous intrusion, which separated the ore body from the main mass along the fault.

PRODUCTION OF SCHEELITE IS 1,000 TONS CONCENTRATES ANNUALLY

Scheelite is mined in the United States by the Atolia Mining Company, with mines at Atolia, Cal., office 1404 Humbodlt Savings Bank Building, San Francisco. P. J. Osdick, Johannesburg, Cal., is perhaps the second largest producer of scheelite in the Atolia field. There are also a large number of small producers. Frank Feldman, care of Nichols Ranch, Weldon, Cal., is producing scheelite. The St. Anthony Mines Company, controlled by Atkins, Kroll & Co., 311 California Street, San Francisco, is mining scheelite near Browns (Toy), Humboldt County, Nev. The same company also controls the Doyle Mining Company, mining scheelite at several points in the Snake Range near Osceola, White Pine County, Nev. Other scheelite deposits in the Snake Range are controlled by Capt. Duncan McVichie, Wewhouse Building, Salt Lake City, Utah, by Millick Brothers, Shoshone, White Pine County, Nev., and J. D. Tilford, Osceola (deposit at Camp Bonita on the east side of the Snake Range near Baker postoffice.) Tilford Brothers, Osceola, also have deposits at that town. Vivian Green, 45 West 34th Street, New York City, controls the Golden Chest mine near Murray, Idaho, from which scheelite is now being mined. The Geological Survey has no exact figures on the production of scheelite at the present time, but it is probable that it is being taken out at the rate of at least 1,000 tons of 60 per cent concentrates per year.

TECHNICALITY CURBS DEMAND FOR MAPS OF MINING AREAS

A technicality, which has been of considerable annoyance to those interested in maps of mining areas, is being taken up vigorously by the Geological Survey with the hope of securing some sensible regulation.

When a report is printed with accompanying maps there is frequently a greater demand for the maps than for the entire report. In some cases there are several hundred copies of the maps requested where the full report is not needed. Under the present regulation the Superintendent of Documents may not have a reprint made of a portion of the report. When the report itself is exhausted, the entire report may be reprinted, but in cases where the map alone is desired no one cares to pay the unnecessary cost of having the report itself reproduced. It is very probable that special legislation will be required before this authority can be vested in the Superintendent of Documents.

GOLD AND SILVER OUTPUT IN 1916 TO BE GREATEST UNDER AMERICAN FLAG

Silver, the Last Metal to Benefit by the Increased Prosperity, Came into its Own During the First Six Months of 1916—With Prices at High Mark a Record-Breaking Amount of the White Metal Has been Mined

The precious-metal mining industries continued active during the first six months of 1916, practically all important mines and mills operating at full capacity, according to a statement just issued by the United States Geological Survey. Shortage of cyanide supplies, feared in 1915, was obviated by increased output of domestic sodium cyanide, which has practically replaced potassium cyanide in the leaching of precious metals. Flotation has begun to increase saving of gold from tailings. There may have been some decrease in gold prospecting during the last eight or ten months, as many old gold prospectors have been giving attention to deposits of tungsten, antimony, quicksilver, and other mineral products whose value has enhanced since the outbreak of the war. There was also some labor shortage at mines and mills owing to high wages paid in factories making war supplies.

Final figures of the Geological Survey and the Bureau of the Mint give a total domestic production for 1915 of $101,035,700 in gold, and 74,961,075 ounces of silver, valued at $37,397,300, against $94,531,800 in gold and 72,455,100 ounces of silver in 1914. These figures include the gold production of the Philippines, which has been steadily on the increase.

The total output both of gold and silver reported for 1915 was the highest ever recorded under the American flag, but if the Philippine output be eliminated the production of gold in the United States proper was but little above the previous record year of 1909. The output of silver for 1915 was materially above the preceding record yield of 1914. For 1916, from the mid-year point of view, the output of gold which is apparently falling off somewhat as compared with 1915, in Colorado, California, Nevada, and some other States, and increasing possibly in Arizona, Oregon, the Philippines, Idaho, Montana, New Mexico, and elsewhere, will probably reach a total somewhat below the high output of 1915. The production of silver, however, will undoubtedly again break all previous records, as the output of silver ores and of the copper, lead, and zinc ores which produce silver in notable quantities will exceed that of any preceding year, owing to steady demand and high prices for all metals.

Prices of silver were low in the greater part of 1915. The monthly average commercial price at New York, which rose to about 52 cents an ounce in November, however, reached 55 cents in December, and climbed steadily to over 74 cents in May, 1916, but fell to about 65 cents in June. The sharp increase in prices resulted from strong demand for the Far East at the end of 1915 and abnormally large requirements by the belligerent countries for coinage for the troops in the field. These demands found available stocks low, largely because of the great falling off in the Mexican output due to the long continued disturbance there. With the consequent inevitable rise in prices domestic producers of silver profited greatly, notwithstanding the increased cost of labor and of mining supplies. Silver is in demand not only for coinage but also for sterling and other silver wares, as well as for drugs and chemicals. The manufacture of silver salts used in photography, particularly in films for hand cameras and cinematographs, has vastly increased in recent years. The mid-year outlook indicates continued demand for silver, the metal last to benefit by the general domestic prosperity.

COAL CHEAPER FUEL THAN OIL, GEOLOGICAL SURVEY SHOWS

In discussing the relative value of coal and oil as fuel, Representative Anthony, of Kansas quoted to the House the statement of the United States Geological Survey on the relative economy of oil and coal:

"Under its investigations it was found, he said, that 76 pounds of water can be evaporated by coal for 1 cent; that only 58 pounds of water can be evaporated by oil for 1 cent, comparing the prices for coal and oil that were then prevailing, the $2.10 per ton for coal and the 69 cents per barrel for oil prevailed at the time these figures were made. Now coal is $2.50 a ton and oil is $1.70 a barrel. I hope the House, in view of the present emergency that confronts the Government, admitted, as it is, by the board that with the provision for the most economical fuel it will have to burn coal, will leave this provision in; and then, if economy demands coal there, let the Government practice economy."

John A. Rice, a mining engineer of El Paso, was in Washington recently on his way to Silver City, Ontario. Mr. Rice has just completed some reconnoissance geological work along the Green and Colorado Rivers in Utah. He also has done some professional work recently in the Wyoming and California oil fields.

GOVERNMENT EXPERTS WELL KNOWN TO MINING MEN

(See cut on front cover)

Hiram Dryer McCaskey, son of General William S. McCaskey of Scotch-Irish ancestry and a native of Pennsylvania, was born at Fort Totten, North Dakota, and spent his boyhood at army posts in the western United States. Graduating in mining engineering at Lehigh University, McCaskey served successively as chemist for mining companies and instructor and head-master in several schools. In 1900 he became mining engineer to the Mining Bureau, Phillippine Islands, and served as Chief of the Bureau from 1903 until 1906, issuing a series of reports on the mineral industry of the Islands, based in part on his exploratory work. He was a member of the first party to cross the northern part of Mindoro from coast to coast, after preceding parties had failed owing to excessive hardships. One of his investigations related to artesian water supply for the leper colony on the Island of Culion, another, at the request of the sugar planters of the Island of Negros, involved the ascent of the Canlaon Volcano and a study of the probabilities of damage to the cane fields from its eruption. He visited the famous Taal Volcano several times, once descending to the floor of the crater during an eruption and for a short time was given up for lost. In 1906 he returned to the United States to pursue graduate studies as Fellow in Geology at Lehigh University.

The boyhood training at military posts in pioneer days of the West inculcated habits of system and quick decision which served him well in his various professional engagements, and which, with his Philippine experience, were doubtless influential in deciding Lindgren to choose him in 1907 as assistant and prospective head of the work of organizing the metal resources section of the U. S. Geological Survey to cope with the statistical canvass of the myriad mines of the United States. The same traits led to his appointment as head and to his successful administration of the Mineral Resources Division after the resignation of E. W. Parker.

In the intervals of his administrative work for the Survey he has found some time to make shore geological investigations in connection with mineral resources work, the more important of which were reconnaissance surveys of the Gold Deposits of Alabama, and of the Quicksilver Deposits of the Terlingua District, in the Big Bend region of Texas, recently put on the map for the whole country by the invasion of the Mexican bandits.

His survey work has taken him to many western mining camps in addition to the gold fields of the Southern Appalachians and to many mining districts in the Philippines. He succeeded Lindgren as author of the gold and silver reports of the mineral resources work and has been the Survey specialist on quicksilver since he joined the organization, and has visited practically all the quicksilver mines of the United States.

Of professional societies, among others, he is a member of the American Association for the Advancement of Science, the Geological Society of America, and the American Institute of Mining Engineers. Of social organizations, he is a member of the Loyal Legion, of the Chevy Chase Club, and of the Cosmos Club. He is an ardent angler. Though fishermen proverbially are unduly optimistic with figures, it does not follow that a statistician may not be a safe and sane fisherman.

APEX LAW A GREAT HANDICAP, SAYS JESSE KNIGHT, PROVO, UTAH

"I have read with interest," says Jesse Knight, of Provo, Utah, the editorial in the April issue of the MINING CONGRESS JOURNAL, entitled 'Leasing Bills,' and after considerable thought I have concluded that the Mining Congress will be unable to offer anything in the way of proposed legislation unless it be in the way of amendments to the existing mining laws, doing away with the apex question and providing for the enlargement of lode mining claims so as to include an acreage of not less than forty acres to constitute the maximum area of a lode claim.

"Personally, I am of the opinion that the power of the Mining Congress in opposing the leasing system will be greater by closely adhering to the present mining laws rather than offering something in the way of constructive legislation.

"My experience of over thirty years as a miner, convinces me that the future development of the West will depend in a great measure upon the opportunity afforded the poor man to better himself by seeking for and acquiring mineral rights, and I cannot conceive of any law or legislation that would be more helpful than the existing law, modified in some particulars, principally those that I have mentioned regarding the enlargement of the lode mining claim and the doing away with the perplexities of the apex question.

"I fear that if we do not hold fast and adhere to the rights accorded the citizen under the existing mining laws and we should attempt to propose or advocate a new system of laws along constructive lines, that we would lose, instead of gaining, ground."

Increases Gold Production

The value of the gold, silver, and lead produced in South Dakota in 1915 from 33 productive mines, 10 of which were placers, amounted to $7,507,782, compared with $7,431,343 in 1914, as reported by Charles W. Henderson, of the United States Geological Survey.

ZINC PRODUCTION INCREASES THIRTY PER CENT OVER THAT OF LAST YEAR

First Six Months of Current Year Show Heaviest Output of Lead and Zinc in History of Mining in the United States—Joplin Probably Will Ship 70,000 Tons More Concentrates This Year Than Last

Reports received by the United States Geological Survey show that the mine production of lead and zinc ores during the first six months of 1916 was much larger than that of any preceding six months. The lead and zinc mines have been able to produce all the ore needed to supply the increased capacity of the smelters. The ore and concentrates were sold at prices which yielded large profits, notwithstanding increased costs of production and the working of large quantities of low-grade ore which could not be mined at a profit under normal conditions. High-grade zinc concentrates free or nearly free from lead and iron continued to be in demand, and the base price offered for such concentrates was generally much higher than that offered for low-grade concentrates.

The shipments of sphalerite concentrates from the Joplin region during the first six months of 1916 amounted to about 180,000 tons, valued at more than $17,000,000, as against 296,000 tons, valued at $23,419,000 for the calendar year 1915. The demand was not as active during the last month of the year, when the base price for concentrates decreased nearly $20 a ton. Unless the base price declines to a point which will prevent the mining of lean "sheet ground" the production of zinc concentrates from the Joplin region in 1916 will probably be 60,000 to 70,000 tons more than in 1915.

Development in the Miami, Okla., camp continued to be favorable, and the production should be much larger during the last half of 1916. The increase from Kansas will not be large, for excessive rains have hampered operations. The "soft ground" mines in southwest Missouri have not shown any largely increased yield, but the "sheet ground" has been actively mined and many new mills put in operation. The strike of the hoistermen in the Joplin district reduced the output in June, though few of the mines were closed down for any great length of time. Some of the mine owners seized the opportunity to make much needed repairs or additions to their plants.

The stock of zinc concentrates unsold in June was larger than usual but probably was not much more than two weeks' production. The production of zinc carbonate and silicate showed no great increase, and the galena concentrates sold indicate a production of about 56,000 tons in 1916, or 11,000 tons more than in 1915. The selling price of the lead concentrates was nearly double the average price in 1915.

The large mines in the disseminated lead district of southeastern Missouri were operated steadily, and although no figures are available for 1916 the output was larger than it was during the first or the last half of 1915.

The number of producing zinc properties in Arkansas increased rapidly and many new mills were operated. The output of sphalerite concentrates was negligible but that of zinc carbonate increased more than 100 per cent. The zinc carbonate is of high grade, and the production of such ore in 1916 in Arkansas is exceeded only by that of the Joplin region.

The zinc ore mined in New Jersey in 1916 was at least as large as in 1915, and the production from Tennessee and Virginia was larger than in the first six months of 1915.

The shipments of raw sphalerite from mines in the Upper Mississippi Valley region steadily increased, and the capacities of the roasting and separating plants were much greater than in 1915. A number of new mines were opened and concentrated plants constructed

The New Diggings camp was especially active, though development was active in all the other camps

The shipments of raw sphalerite concentrates amounted to more than 100,000 tons, compared with shipments of 162,000 tons during the calendar year 1915.

In the western States small increases of both lead and zinc were made in Arizona, Colorado, New Mexico and Washington. In Nevada an increased quantity of zinc ore was shipped from Clark County and the lead ore shipments from the Pioche, Goodsprings and Eureka districts indicate a considerably large output of lead from Nevada for 1916.

In Utah the Bingham district made a record output of lead during the first six months of 1916. The zinc production of Utah will probably be only slightly more in 1916 than it was in 1915.

The Coeur d'Alene region in Idaho shipped 30,000 tons of lead ore or concentrates a month. The Interstate, Callahan, Success, Frisco and other mines were shipping more than 8,000 tons of zinc concentrates or ore monthly, which is much more than the shipments in 1915.

In Montana the lead production increased because more lead-zinc ore was mined. The increased yield of zinc probably amounted to above 30 per cent, as the Butte & Superior mine was producing at the rate of 96,000 tons of concentrates yearly and the Elm Orlu at the rate of 60,000 tons.

The reports from all States indicate that the production of zinc ores in the United States in the first six months of 1916 was at a rate of 25 to 30 per cent larger than that in 1915.

NEVADA'S COPPER OUTPUT IS DOUBLE THAT OF LAST YEAR

Mine reports received by the U. S. Geological Survey from V. C. Heikes of the Salt Lake field office indicate that during the last six months the mining industry in Nevada has experienced one of its greatest revivals. Old mines closed down for years have resumed or are being put in shape for production, and the regular producers have increased their output to the fullest capacity. At many points the use of tractor engines, hauling on each trip as much as 30 tons of ore between mine and railroad have helped to improve conditions, as formerly there were not teams enough for all purposes. The many milling plants of the State are reported to be in full operation, and a number have adopted the flotation process for increased saving. In the Yellow Pine district five dry mills are operated on zinc ores. Only one of the two copper smelters in Nevada was in operation.

Gold will likely show little increase. The declining production at Goldfield may be made up to some extent from the general increase in output of ores. No new gold deposits of note have been found. The placer-gold production at Manhattan and Round Mountain is about the same, the latter making up for any decrease in the former. Silver may show a gain from increased operations made at Rochester, but the increase will probably be offset by the idleness of the mines in Churchill County. Little if any of the silver output is held in storage for higher prices compared to the quantity so held in 1915.

The production of ore containing lead has been greater than in recent years, principally from Pioche, Goodsprings, and Eureka. Ely produces most of the copper, and at the rate of production for the last 6 months will yield 92,000,000 pounds of the metal in 1916. Copper properties in the vicinity of Luning and Yerington have been active in shipping low-grade ores to the Salt Lake smelters at the rate of about 2,000 tons monthly. Deposits of zinc ore have been opened in Elko County, where about 600 tons is being produced and shipped to eastern markets every month. In Clark County, around Goodsprings, about 2,800 tons of oxidized zinc ore was shipped in May and as much during the previous months. At Pioche a small output of zinc sulphides was recorded.

As the copper output has been increased more than 50 per cent, the value of the output at present prices will be double that of the past year.

JEFFREY OPENS OFFICES IN DALLAS AND SAINT LOUIS

The Jeffrey Manufacturing Company recently opened new branch offices at Dallas and St. Louis.

The Dallas office will be located in the Commonwealth National Bank Building, and will be in charge of J. U. Jones. With twenty years of successful salesmanship to his credit, and a thorough personal knowledge of the State of Texas and the requirements of its buyers, Mr. Jones is especially well equipped to take care of the constantly increasing demand for Jeffrey products in his vicinity, and render valuable assistance to clients in solving their elevating, conveying and transmission problems.

W. V. Cullen has been placed in charge of the St. Louis office, with headquarters in Room A-21, of the Railway Exchange Building, which office has been opened in order to supply the many requests from manufacturers in and about St. Louis for advisory service in connection with their conveying and power-handling problems. Long experience in sales engineering work, and training in the application of Jeffrey products especially qualify Mr. Cullen for handling this work.

Vanadinites Little Used

Vanadinite ore was at one time considerably used but since the opening up of the large patronite (vanadium sulphide) deposits at Minas Ragras, Peru, and the roscoelite deposits near Placerville, Colorado, very little vanadinite has been used in this country although it is understood that it has been exploited abroad, particularly in Spain. The Primos Chemical Company, Primos, Pennsylvania, and the American Vanadium Company, Vanadium Building, Pittsburgh, Pennsylvania, are the two principal manufacturers of ferro-vanadium in this country. The Electro-Metallurgical Company at Niagara Falls, New York, makes ferro alloys.

Geologists Sent to Idaho

J. B. Umpbley and E. L. Jones, of the Geological Survey, are engaged in work in the Coeur d'Alene district. They will also visit the Pine Creek district in the same vicinity. Considerable new mining activity is now in progress in the Pine Creek district.

CRUDE OIL PRICES MAINTAIN NEW HIGH LEVEL DURING LAST SIX MONTHS

Drilling Activity Increases Enormously But No New Pools Discovered During First Half of Year—Development of Old Pools Carried on With Great Success —Output Greater Than Half of Last Year's Total

The quantity of petroleum marketed in the United States during the first half of 1916 is estimated by John D. Northrop, of the United States Geological Survey , at 140,000,000 barrels. His estimate is moderate and his apportionment of the output among the major fields is as follows:

Field	*Barrels*
Appalachian	11,400,000
Lima-Indiana	1,800,000
Illinois	7,900,000
Kansas and Oklahoma	50,500,000
Northern and Central Texas	4,200,000
Northwest Louisiana	6,800,000
Gulf Coast	11,400,000
Wyoming and Montana	2,400,000
California	43,500,000
Miscellaneous (Colorado, Michigan, and Missouri)	100,000
	140,000,000

This quantity, which includes a little oil actually produced in 1915 but marketed during 1916, is appreciably less than the output during the first half of 1915, though it is greater by about 5,000,000 barrels than one-half the entire quantity marketed last year. When it is considered that the first half of 1915 includes the period of maximum production of the Cushing pool in Oklahoma and the Crichton pool in northwestern Louisiana the disparity in output between the corresponding periods is not especially significant. The magnitude of this quantity, the fact that it is greater than one-half the total petroleum marketed in the United States in 1915, and the further fact that it reflects the results of general activity throughout all oil-producing areas rather than flush production in restricted areas is, however, significant and leads to no other conclusion than that the final statistics of oil marketed in 1916 are destined to establish a new record.

The outstanding feature of the petroleum industry during the half-year just closed was the high level reached in the prices of crude oil in March and maintained firmly to the end of the period. This level involves prices ranging from 90 to 350 per cent higher than those of a year ago for high-grade Eastern and Mid-Continent grades and reflects less strongly the decreased capacity of Cushing than it does the increased demand for crude oil resulting from the activity of a large number of new refineries installed during the recent period of low prices.

As a consequence of the incentive afforded by the high prices in the early part of 1916, activity in drilling increased enormously in all fields with the opening of spring, and though within the half-year period no strictly new pools were discovered there was a development of old pools and new extensions that was attended with gratifying success. So marked was this success in the Augusta and El Dorado pools in southern Kansas, the Blackwell pool in Kay County, Okla., and the Shamrock extension of the Cushing pool in Creek County, Okla., that at the end of the half-year period the production and consumption of crude oil east of the Rocky Mountains are essentially in balance and a tendency toward weaker prices for Mid-Continent grades is apparent. Thus far this tendency has affected high-grade crude oil only to the extent of lowering the premium on certain types that are in greatest demand, but its influence on market quotations is inevitable if production continues its steady increase or if the remarkable wildcat campaign now under way in the Southwest results in the discovery of even one considerable pool of high-grade oil.

Little Data on Sylvanite

The Geological Survey has issued nothing especially on sylvanite, but the assay of tellurium-bearing ores including sylvanite was treated in Bulletin 253, and Professional Paper 54 treats of the Cripple Creek District, Colorado, which is the great sylvanite and gold telluride bearing district. These publications are both out of stock at the Survey, but Bulletin 253 may be purchased from the Superintendent of Documents, Washington, D. C., for ten cents. Professional Paper 54 is entirely out of print, but a copy of this report may be consulted in the public libraries of the larger cities of the country.

Jeffrey Has New Bulletin

The Jeffrey Manufacturing Company of Columbus, Ohio, has issued its bulletin No. 177, dealing with self-propelling wagon and truck loaders. These loaders are especially valuabel in handling crushed stone, sand, gravel, clinker, coke and similar materials. They have a capacity of 1 to 1½ cubic yards per minute and will load crushed stone into an average size wagon in three or four minutes. The wages of two to five shovellers are saved.

QUICKSILVER OUTPUT IN 1916 WILL EQUAL THAT OF LAST YEAR

The domestic quicksilver industry has continued active during the first six months of 1916, and the average price for the period has been about double the exceptionally high average for the entire year 1915.

Figures just compiled by the United States Geological Survey show that the total production of quicksilver in the United States in 1915 was 21,033 flasks of 75 pounds each, having a marketed value of $1,826,912, or an average of $86.86 per flask. Of this output 14,283 flasks, selling for $1,174,881, came from California, and the remainder almost entirely from Texas and Nevada. The actual average sales value for the whole country exceeded the average market value in San Francisco—which was $85.80 for the year. In 1914 the domestic output was 16,548 flasks, valued at $811,680, and therefore the production for 1915 showed an increase of over 27 per cent in quantity and 125 per cent in value.

The increased domestic demand for quicksilver in the last eighteen months has been due mainly to war requirements for fulminate and drugs. Early in 1915 domestic stocks began to be drawn upon and production became more active, but as foreign embargoes left the field clear and domestic output was unable to meet the rapidly increasing call for the metal, prices continued to rise throughout the year and into the early months of 1916, the high mark of $300 a flask being passed in February. Naturally every mine and prospect became of interest. The reaction set in, however, as the high prices drew out quicksilver supplies in Mexico and elsewhere that had been originally purchased for amalgamation of gold and silver ores, and finally as the British Government permitted exports to America under certain limitations. The average monthly domestic price in San Francisco, which had climbed from $51.90 in January, 1915, to $295 in February, 1916, dropped to $219 in March, $141.50 in April, $90 in May, and about $72 in June.

The market remained steady and in general highly profitable, and as domestic prices have dropped below London quotations exports rather than imports of the metal may be expected. There is probably no great quantity of metal stored, and consumption is undoubtedly abnormally large.

Favorable markets have brought out great activity in search for new prospects, and discoveries near Morton, Wash., and Beagle, Oreg., in 1916 have led to some development and construction of reduction plants. Also in the Skull Valley deposits, Ariz., referred to many years ago by W. P. Blake, and at Black Pine, Idaho, some activity is reported. Many old furnaces have been repaired or enlarged in California, Nevada, and Texas, old workings have been reopened, and new discoveries have been developed.

Very likely the exceptionally high prices of the last few months have led to gouging and robbing many mines of their best ore, and the average tenor of the ore worked by the larger mines during the first half of 1916 may prove considerably below that of previous years. Moreover, some mines have undoubtedly passed their maximum productivity. These conditions are probably offset to some extent by the fact that more furnace capacity is now working on quicksilver ores than at any previous time in the history of the industry. On the whole the midyear outlook is for an output in 1916 fully equal to that of 1915.

MANGANESE MINING SHOWS GREAT ACTIVITY DURING 1916

There has been a greatly increased activity among the manganese mines of the United States during the first six months of 1916. This activity is shown by the operation of new mines, the reopening of old mines, and more regular production from the mines already active. There is a prospect that the production for the entire year, according to D. F. Hewett, of the U. S. Geological Survey, will greatly exceed that for 1915, which was 9,651 tons, the largest since 1901. Several discoveries are reported from Arizona, California, Oregon, Utah, and Virginia, and there are new operators in Arkansas, California, New Mexico, Utah, and Virginia.

During the first quarter of 1916 the prices of all grades of manganese ore rose rapidly to the highest figures recorded in 30 years. Prices of 60 to 65 cents a unit for ore containing 45 to 50 per cent of manganese and more than 1 per cent of iron were freely offered about April 1 and it is reported that 70 cents a unit, or $35 a ton was paid for several lots. During the second quarter prices remained constant at these figures. Large quantities of Brazilian ore continue to be received, and there is a prospect that the imports will exceed those of 1915, which were the largest on record with the exception of one previous year.

Several new producers have entered the ferromanganese field, and although imports from England appear to be greater than last year, it appears that the domestic production for 1916 will be the largest in the history of the country. Prices for ferromanganese for immediate delivery in March reached the highest figure ever recorded—$425 a ton for small lots—and large quantities were sold for $350 to $400 a ton. For delivery within six months the price has remained constant at $175 a ton. During the second quarter prices receded to $350 a ton for immediate delivery.

As long as the present demand for steel continues there is little prospect for greatly reduced prices of either manganese ore or ferromanganese, and even if peace is declared during the winter prices can scarcely decline to normal for at least six months or a year.

Producers of manganese ore particularly should realize that never before for so long a period has there been a better opportunity for the profitable mining of manganese ore. They should realize also that this condition cannot continue indefinitely.

LAKE SUPERIOR IRON MINES SHIPPING ORE AT RATE OF 2,000,000 TONS MONTHLY

An Increase of Eighty-three Per Cent Shown During First Five Months of 1916 Over the Corresponding Period of Last Year—United States Will Produce 70,000,000 Tons of Iron Ore This Year, Thus Setting New High Record

The first six months of 1916 in the iron industry showed a continuation of the highly prosperous conditions that prevailed during the last four or five months of 1915, according to E. F. Burchard of the United States Geological Survey. In fact, activity was even greater in 1916 than in the first half of 1915. Large increases are shown in the output of both iron ore and pig iron. The shipments of ore from the Lake Superior region during the first five months of 1916 were more than 10,000,000 gross tons, or 83 per cent greater than those of the corresponding period of 1915.

Ore prices at lower lake ports for 1916 were increased 75 cents a ton over those for the season of 1915, but lack of boats is reported to have forced concessions in the price of ore from some mines that do not control their Lake transportation facilities.

The production of coke and anthracite pig iron in the first five months of 1916 showed an increase of 66 per cent over that of the corresponding period in 1915, and prices are from $5 to $7.25 per ton higher, or 33 to 40 per cent above those in June, 1915

Prices for steel bars and beams have increased 100 to 130 per cent over those of a year ago, and if conditions are not adversely affected by miners' strikes now threatening and if the present strong demand for iron and steel continues, the total ore output from the Lake Superior region may possibly reach 60,000,000 gross tons

Birmingham and other iron districts are not capable of such rapid increases in output as the Lake districts, and if 10,000,000 tons be estimated for the production of all other districts it indicates a possible total domestic production of iron ore of 70,000,000 gross tons for 1916 At any rate, there are good indications that a new high record of iron ore production will be made this year

GRAPHITE PRICES SHOW INCREASE DURING 1915

Madagascar graphite was imported in 1915 in considerably larger amounts than in 1914 according to data secured by the United States Geological Survey. The price c. i. f. New York increased from about 6 cents per pound at the beginning of the year to 11 or 12 cents at the end of the year. There was no notable change in the character of the graphite as compared with 1914, it averaged about 85 per cent graphitic carbon, was not subdivided into grades and required finishing in this country before utilization Most of it has entered the manufacture of crucibles. The scarcity of bottoms and the increasing demand in France for the Madagascar product makes it impossible at present for American firms to secure as much of this product as they desire.

The price of Korean graphite early in 1915 was about $25.00 per ton c. i f. New York. As a result of increased marine freight rates and the scracity of bottoms the price in New York rose to about $40.00 per ton at the end of the year and $50.00 in March, 1916 Some of the material has come by rail from Seattle to the Atlantic Seaboard. The Japanese government has required no guarantees from consumers in regard to the utilization of this graphite. Korean graphite is amorphous, analyses 80 to 85 per cent graphitic carbon, and is used mainly for stove polishes, foundry facings, paint pigment and the prevention of boiler scale

The unsettled conditions in Mexico resulted in greatly reduced importations of Mexican graphite in 1915 as compared with 1914 The better grades of this graphite suitable for pencil manufacture normally bring 4 to 5 cents per pound c. i. f. New York. Late in 1915 the price rose to 5 to 6 cents per pound

The better grades of American flake graphite sold in large lots at the mines in the Eastern United States at from 6 to 8 cents per pound and in New York City at from 8 to 10 cents per pound. Small lots sold as high as 14 to 18 cents per pound in New York. Market conditions were reported by most producers to be very good.

Almost the entire Canadian production of graphite was imported into the United States, where it sold for about the same prices as the very similar American flake graphite The imports were much larger in 1915 than in 1914

GOVERNMENT EXPERTS WELL KNOWN TO MINING MEN

Photo by Harris & Ewing

SIDNEY PAIGE
Geologist

Sidney Paige is one of the few members of the Geological Survey who is a native of Washington, D. C. His early education was acquired in the public schools here. Later he did two years' work at the University of Michigan, but did his graduating work at Yale. Previous to joining the Geological Survey in 1902, he spent two years with the Isthmian Canal Commission in Nicaragua. Some years later he spent three months in Panama doing geological work under the direction of the Panama Canal Commission.

For six summers Mr. Paige did work in Alaska. He visited nearly every placer district of prominence in that territory. In addition he has done geological work in the quartz mining regions and has made some study of Alaskan coal.

Mr. Paige made a detailed investigation of the mineral resources and the geology of the Llano-Burnette area of Texas. He also spent considerable time at Silver City, N. Mex., in studying the important mining regions in that vicinity. He is the author of the Silver City folio which was published by the Geological Survey recently.

Perhaps the most important work done by Mr. Paige was his investigation of the pre-Cambrian geology of the Black Hills. During this work he discovered interesting facts regarding the Homestake ore body. Last year Mr. Paige devoted to the copper deposits of Burro Mountain district in the vicinity of Tyrone, N. Mex.

On July 1, Mr. Paige assumed the duties of chief of the section of western areal geology with supervision of the parties doing general geologic work in the Western States.

EVERY UNDERGROUND WORKER WILL BE SKILLED FIRST-AID MAN IN TEN YEARS, IT IS PREDICTED

With regard to the Bureau of Mines and its first-aid movement, the *Journal of the American Medical Association* in a recent issue prints the following letter from F. E. Clough, M.D., of Lead, S. D.:

"In connection with the propaganda for the spread of the First-Aid Movement, which is now being fathered by a Committee of which Dr. Joseph C. Bloodgood of Baltimore is the chairman, practically no credit has been given to the most active agent in this field—the United States Bureau of Mines.

"For a number of years the Bureau of Mines has had specially trained groups of men living in cars equipped to fight mine fires and other mine catastrophes stationed at stragetic points throughout the country. From time to time these cars travel to all the mining districts, and when not engaged in fighting fires, give instruction on First Aid to the injured and in the use of the different forms of breathing apparatus to be worn in case of mine fires.

"After thoroughly training many different groups in a State it is the custom of the Bureau of Mines to hold a contest in which these different teams participate. For the past three years the teams winning these State Contests have participated in a National First Aid Meet in which suitable prizes are given. Last year at the Annual Nation-Wide Contest held by the Bureau of Mines at San Francisco, teams came from practically every mining State in the Union and from Alaska as well. So widespread has this movement become in the mining world that, almost without a single exception, every up-to-date mining company is devoting much time to training their men in this line. This spirit has become generalized only through the teaching of the Bureau of Mines. We are of the opinion that in less than ten years hence every underground worker in the United States will be compelled to become proficient in the handling of injured men.

"I have been connected with mining hospitals for some time, and never having belonged to the Bureau of Mines, am offering this testimony to show, from the standpoint of a mining surgeon, what a potent factor in the First-Aid Movement the United States Bureau of Mines has been from the earliest days of this movement."

UNPRECEDENTED ORE SHIPMENTS BLOCK RAILROADS TO UTAH SMELTERS

State Is Producing Copper at Rate of 225,000,000 Pounds for the Year—Utah Copper Company Is Treating 34,000 Tons of Ore Daily—Silver Production Makes Big Gain Over Last Year

The high prices of metals during the last six months caused Utah producers to put all available miners to work getting out ore. In some of the snow-bound camps large quantities of ore were stored during the winter months and when this was released to the buyers a curtailment was requested by the smelters of all producers exceeding contract limits. During May and June hundreds of cars of ore, waiting to be unloaded, blocked the railroad lines to sampler and smelters. Much of the ore is stockpiled, as it is impossible to treat more than a certain quantity on account of the limited working capacity.

Reports received by the U. S. Geological Survey from its field office at Salt Lake City indicate that no great increase in gold may be expected for 1916, but silver production, which is dependent largely on the production of lead, has gained over previous years, principally from Bingham. The lead output from ores produced at this camp will exceed all former totals.

At the present rate of output, fully 225,000,000 pounds of copper will be produced in 1916, this estimate having been made from the increased tonnage being treated at the concentration mills near Garfield. The Utah Copper property mined and shipped in May 911,000 tons of ore, and during June, the rate of output was greatly increased, and about 34,000 tons of ore was treated daily. Other copper mines are producing to the capacity of their equipment. At the increased rate of production and higher price, the total value of the copper output will probably be double that of 1915.

Zinc production from sulphide concentrate and oxidized and sulphide ores will not largely exceed the 1915 output of 22 million pounds, estimated as spelter, Park Ciy, Bingham, Tintic, and Promontory district were the principal regions producing.

Among the metallurgical improvements is the establishment of sulphuric acid works at Garfield and the prospect for treating lower grade copper ores by leaching. At Silver City, in the Tintic district, the chloridizing leaching plant has made its third shipment of silver precipitates and the process is now considered a success.

SAFETY ASSOCIATION'S BULLETINS PLEASE WORKMEN IN MINE

A splendid outlook for the work being conducted by the mining section of the National Safety Association is seen by H. M. Wolflin, mine safety engineer, of the Bureau of Mines.

Mr. Wolflin attended the recent meeting of the executive committee of the National Safety Council, which formulated the program for the council meeting to be held in Detroit October 17-20.

The executive committee of the council consists of H. M. Wilson, chairman; B. F. Tillson, of the New Jersey Zinc Company; H. G. Davis, of the Delaware, Lackawanna & Western Railroad; C. E. Pettibone, of the Pickands-Mather Company, Cleveland, Ohio; W. A. Luce, of the Ellsworth Collieries Company; J. W. Paul, formerly mine safety engineer of the Bureau of Mines; R. Dawson Hall, of *Coal Age*, and Mr. Wolflin, who is secretary of the council.

Mr. Wolflin is of the opinion that the mining section is filling a want which was not being met before in supplying safety bulletins of interest to the workmen in mines.

Members of the safety council noticed that there were a great many publications of interest to the technical men, but very little that would appeal to the miner himself. As a result, the publication of these bulletins was begun. They are so arranged that pictures tell the principal stories. The popularity of these bulletins is indicated by the very large demand for them.

JEFFREY MANUFACTURING CO. REOPENS SEATTLE OFFICE

The Jeffrey Manufacturing Company, of Columbus, Ohio, announces the reopening of their northwestern branch office at Seattle, Wash., and the appointment of Percy E. Wright, Consulting Mechanical Engineer, as District Manager for Oregon, Washington, Alaska, British Columbia and Alberta. Mr. Wright, who has been in the Northwest since 1910 and whose connection with this company dates back to 1902, has had a wide and varied experience and training in the handling of the Jeffrey Line in the Engineering, Construction and Sales Departments, working in solving elevating, conveying and transmission problems.

ARIZONA PRODUCING COPPER AT RATE NEARLY DOUBLE THAT OF ANY OTHER STATE

If Pace Set During First Six Months of 1916 Is Kept Up State Will Have Output for Year of 600,000,000 Pounds of Copper—Inspiration Plant Supplying One-fourth of State's Copper—Great Activity Being Shown in Gold and Zinc Mining

The mines and smelters of Arizona have been working at a pressure so high in 1916 that they are probably making record productions of all metals. If they continue to work at the present rate during the year they will make an output of over 600,000,000 pounds of copper, against about 450,000,000 in 1915, according to reports received by the U. S. Geological Survey from Victor C. Heikes, of the Salt Lake Office. A corresponding increase in the output of the precious metals and an increase in that of lead and zinc, which is probable will, at the greatly increased prices, make the total value of the output in 1916 nearly double that of 1915, which was about $88,000,000. Thus Arizona not only retains first place as a copper producer, but is producing at a rate nearly double that of any other state. Aside from a general effort to take advantage of an unusually active market, several factors have aided this increase, such as the settlement of the strike at the Clifton-Morenci mines in January. The International smelter, which treats Inspiration ore, contributes the greatest part of the increase, for this plant is supplying about one-fourth of the total copper. Marked increases and improvements were made at the United Verde, Miami, Calumet and Arizona, and Old Dominion mines, and the Sasco plant in Pima County was again blown in. The railroad to Ajo was completed and work has been begun there on a 4,000 ton leaching plant.

There is great activity in the production of gold, especially in Mohave County, and the high price of zinc has stimulated production at the Tennessee, Union Basin and Kingman zinc properties. The mill at the Union Basin mine was enlarged, and work at the San Xavier mine in Pima County was resumed.

DEMAND FOR CEMENT CONTINUES DESPITE INCREASING PRICES

The first half of 1916 has been a busy period for the Portland cement industry in most parts of the United States. Labor troubles have caused the temporary shutting down of a few plants in Illinois, and the business ordinarily taken care of by these plants has gone to others in the Central States, but none has been reported as having voluntarily closed in 1916.

The opening of a new cement plant nowadays, when the country is so well dotted with plants, is an event of importance, and the fact that two new ones have begun operations is of considerable interest. Both of them are in the Middle West, one at its extreme north, at New Duluth, Minn., the other at its extreme south, at Houston, Tex. The location of both was influenced more largely by commercial considerations than by the proximity of raw materials. The plant at New Duluth, a mill of the Universal Portland Cement Company, utilizes limestone brought by boat from the shore of Lake Huron near Alpena, Mich., and slag from the blast furnaces of the Minnesota Steel Company at New Duluth. The plant at Houston is Mill No. 2 of the Texas Portland Cement Company. It manufactures cement from oyster shells dredged from a reef in Galveston Bay and clay from Harrisburg, Tex. This plant is on tidewater, and efforts will be made to establish for it an export trade with South America.

In 1914 and 1915 there was a decrease in the production of cement, consumers exercising strict economy in its use, but the year 1916 shows a reaction, having opened with a demand unprecedented for a midwinter season. Prices, which had averaged only 86 cents a barrel for the entire year 1915, began to rise toward the end of that year and in the Eastern and Middle States, where cement sold at 70 to 90 cents a barrel, they continued to rise in 1916 until, in June, they ranged from $1.10 to $1.25 a barrel. The increased prices, of course, do not mean an equivalent net increase in returns to the manufacturers, for the costs of explosives for blasting and of coal have both risen, and laborers are in many places demanding an increase in wages. These comparatively high prices have not, however, checked the demand for cement. Many manufacturers are selling all they can produce, and others are even drawing on stocks so as to fill orders promptly.

Although no statistics have been reported to the United States Geological Survey at this date, it is believed that the total output of Portland cement for the first half of 1916 has considerably exceeded that for the corresponding period of 1915. In general an optimistic feeling prevails among manufacturers, and it is confidently predicted that the year will show a gain over 1915, both in production and shipments of Portland cement. Moreover, there is a fair possibility that they will exceed those of 1913 and thus establish a new record.

LORDSBURG DISTRICT DOUBLES ITS PRODUCTION OF COPPER-GOLD ORES

New Mexico Camp Makes Fine Showing, Mid-Year Estimate of Geological Survey Shows—State Shows Appreciable Increases in Lead, Copper and Zinc Production During First Six Months of the Current Year

The mines of New Mexico during the first six months of 1916 show small increases for gold and silver and appreciable increases for lead, copper, and zinc, according to Charles W. Henderson of the United States Geological Survey.

In the Mogollon district, Socorro County, which in 1915 produced 40 per cent of the gold and 65 per cent of the silver output of the State, the Fanney and the Last Chance cyanidation mills were operated continuously, and the Cleaveland-Weatherhead mill, idle in 1915, was placed in operation in April. Gold bullion and concentrates continued to be shipped from the Elizabethtown district, Colfax County, and gold bullion from the Whiteoaks district, Lincoln County. The output of silver was affected considerably by the idleness of the Cossak cyanidation mill, in the Cochiti (Bland) district, Sandoval County. Gold-copper ore continued to be shipped from the Orogrande district, Otero County. The purchase by the Phelps-Dodge Company of a large area in the Organ Mountain district, Dona Ana County, promises a future production of all five metals. Siliceous and copper ores carrying gold were shipped from the Lordsburg district in quantities that indicate an output nearly double that of 1915. The Santa Fe Gold and Copper Co.'s matting plant at San Pedro was operated continuously. The Burro Mountain Copper Co.'s flotation mill in the Burro Mountain district was placed in operation in April, 1916. The Chino Copper Co.'s mill, which in 1915 produced concentrates containing 68,293,893 pounds of copper, yielded during the first quarter of 1916 a total of 16,267,450 pounds, the total quantity of ore treated for the three months being 714,400 tons, an average of 7,850 tons a day, the highest average tonnage treated by the mill since it began operations. Shipments of copper from the Magdalena district increased. Lead ore was shipped from Cooks Peak and Tres Hermanas districts, Luna County; from the Central and San Simon districts, Grant County; and from the Magdalena district, Socorro County. Increased shipments of zinc carbonate and zinc sulphide concentrates were made from Magdalena, Hanover, Cooks Peak, Florida, Tres Hermanas and Pinos Altos districts. A mill was erected in the revived Steeplerock district, Grant County, and some shipments were made.

Tantalum Difficult to Analyze.

There is no simple and accurate test for tantalum. One of the indicative tests is the specific gravity which is always high. The ordinary tantalum minerals, columbite, or tantalite, as it is known when it is almost pure manganese iron tantalate, is black or nearly black and has a specific gravity ranging from 6 to 8.2 depending on the quantity of tantalum present. Tantalum and columbium are almost invariably present in the same mineral and if the columbium is in large quantity the specific gravity is lowered. The streak and color are almost black, but are probably browner if much manganese is present. Columbite is insoluble in acids but if fused with soda the fusion is decomposed by hydrochloric acid, giving a white, curdy precipitate. On adding metallic zinc to the solution a blue color is given which disappears on dilution with water. This test, however, merely proves the presence of columbium. The presence of tantalum can only be proved by careful chemical work. Another indication of the possibility of the presence of tantalum is the occurrence of the mineral. Tantalum minerals are known to occur in quantity only in pegmatites, though small quantities of the mineral are found in certain veins, such as the tin vein of Cornwall and small quantities of tantalum and columbium oxides (up to 2 per cent) are found in certain tungsten minerals from some localities.

Du Ponts Issue Booklet

Many features about the latest booklet published by the du Pont companies of Wilmington, Del., are unique. The little volume is devoted to very readable information in regard to du Pont products. It is another evidence of the presence of a high percentage of "live wires" in the management of this concern. The book is bound in fabrikoid, which is the du Pont substitute for leather, and contains a variety of cuts. It is a valuable possession.

J. D. Pardee, of the Geological Survey, has gone to Montana, where he will make a reconnoissance of the mining district in the Philipsburg region. He will also make some examinations for the classification of phosphate lands.

GOVERNMENT EXPERTS WELL KNOWN TO MINING MEN

Photo by Harris & Ewing

H. M. WOLFLIN
Mine Safety Engineer, Bureau of Mines

H. M. Wolflin received his elementary education in the common schools and high schools of California, Texas and Arizona. He was graduated from the University of Arizona with the degree of Bachelor of Science in 1907. He returned the following year and was graduated with the degree of B. S. in Mining engineering. In October, 1908, he entered the Technologic Branch of the United States Geological Survey as Junior Engineer. He was engaged for a time at the Pittsburgh, Pa., station with the physical testings of explosives and then transferred to the field work of the mining division, where he was engaged in mine safety investigations and coal sampling in West Virginia, Pennsylvania, Ohio, Washington, and British Columbia, until he was placed in charge of the newly established Mine Rescue Station in Seattle, Wash., early in 1910.

He was made district engineer of the Bureau of Mines in the Northwest when the Bureau was established, and had charge of mine rescue car No. 5 and the Seattle station, though most of his time was spent on safety investigations in the coal and metal mines of the district.

He was given leave of absence to attend Columbia University for a year and was graduated from the School of Applied Science in 1913 with the degree of Master of Arts; after which he was given the problem of investigating metal mine ventilation for the Bureau and worked at this until January, 1914, when he was placed in charge of the cooperative work between the Bureau of Mines and the Industrial Accident Commission of the State of California. He was successful in organizing this work and in securing the cooperation of the mine operators, who were at first strongly opposed to interference of the State and Federal officials in their affairs.

A survey of mining conditions was made through the State of California, after which mine safety rules were prepared by a committee composed of three mine operators, three miners and Mr. Wolflin. These rules were adopted by the Industrial Accident Commission and put in force on January 1, 1916. The Commission has authority to enforce such rules almost as vigorously as laws can be enforced.

Mr. Wolflin was then promoted to the position of Mine Safety Engineer of the Bureau of Mines and was transferred to Pittsburgh, Pa., to take charge of the Mine Safety Investigation of the Bureau, including its mine rescue and first-aid work.

Mr. Wolflin is a member of the American Institute of Mining Engineers, the American Mining Congress, San Francisco Engineers Club, etc.

Adoph Knopf, of the United States Geological Survey, is making an investigation of tin deposits thirty-five miles north of Battle Mountain, Nevada. Before returning to Washington he probably will be assigned other geological work in the same general region.

E. C. Eckles, formerly of the Geological Survey, but now engaged in private practice in Washington, also was a member of the Fort Oglethorpe camp.

B. S. Butler is making some special examinations of the cottonwood district of Utah in the interest of the Geological Survey.

J. S. Diller, of the United States Geological Survey, has been called to Lassen Peak, Cal., by the renewed activities of that volcano. Dr. Allen, of the Carnegie Geographical Laboratory and Dr. David T. Day, of the Bureau of Mines, also have gone to investigate this interesting example of vulcanism.

Ralph Arnold, a geologist of Los Angeles, formerly with the United States Geological Survey, was in Washington last month en route to Venezuela. He will do geological work in connection with the General Asphalt Company's oil developments.

MONTANA'S METAL OUTPUT IN 1916 PROMISES TO EXCEED $140,000,000

First Six Months of the Year Indicate that Record-Breaking Output of Last Year Will Be Exceeded Greatly This Year—Output of Copper Promises to Reach 350,000,000—Anaconda Is Averaging 26,000,000 Pounds a Month

The unusually high prices of metals in 1916 have stimulated mining to a marked degree in Montana, especially at Butte. At the present rate of production, there will be notable increases in the output of all metals, and a marked increase in the total value of the output. According to reports received by the United States Geological Survey from its Salt Lake representative, V. C. Heikes, the output is now being made at a rate which will give a total value of about $140,000,000 to the year's metals instead of about $87,000,000, the value in 1915. The production of gold from precious metal bullion is showing a large increase and will be augmented by gold from a much greater output of copper ore. The production of silver will doubtless keep pace with that of copper and with the increased output of zinc.

The production of copper, though below the normal in January and February, has been increased toward the middle of the year by both the Anaconda and East Butte companies. This gain indicates that the output of copper for the year may be 350,000,000 pounds against 275,000,000 pounds in 1915. The East Butte mine was averaging 1,300,000 pounds a month the first five months and the Anaconda about 26,000,000 pounds a month, with a better rate in April and May. The latter company has been busy remodeling its big concentration plant at Anaconda and constructing a zinc plant, as well as building a new refinery at Great Falls.

An increase of about 30 per cent in the output of zinc during the year is indicated. For the first quarter of 1916 the Butte and Superior mine produced nearly 48,000,000 pounds of gross zinc in concentrates, or at the rate of 192,000,000 pounds a year. The Elm Orlu mine has also increased shipments of zinc concentrates to about 5,000 tons a month and may increase this rate. The lead production will probably be increased because of the great amount of concentrates derived from lead zinc ores. High prices of metal have given better wages and unusual profits, and may result in record outputs of all metals.

MILLION YEARS SMALL UNIT IN CALCULATING GEOLOGIC TIME

Geologic time has been so long that years and centuries do not count at all, as even the minor episodes lasted thousands or tens of thousands of years. The age of the older stratified rocks runs into millions of years, and in estimating their age it is hardly safe to use a smaller unit than a million years and the margin of error in such an estimate is probably several million years.

A year is too small a unit for such measurements and there is no means of comparing it directly with the quantity to be measured. The problem is similar to that which confronts the man who stands looking down many miles of track and tries to estimate the number of ties in that distance by counting the few ties in sight. He can see a few score of them, but farther on they are indistinguishable and still farther the track itself narrows to a vanishing point, yet he knows there must be thousands of ties in the stretch of track that he can see. Perhaps miles down the track is a building and from its apparent size he can guess how far away it is and thus estimate, within a few thousands, the number of ties between him and the building. Geologists have to do the same thing. They know the rocks must be millions of years old, for during the few centuries of human experience the addition to the thickness of the stratified rocks has been very slight, and they have a few landmarks which help them to estimate how many millions, but not more close than that.

The age of the glacial deposits can be estimated more closely, as they lie, figuratively speaking, about at that point on the track where the ties begin to appear to merge and to be indistinguishable. We have several criteria, such as the rates of recession of Niagara Falls, of building forward of certain deltas, and of wearing away of the coast which enable us to estimate rather closely, geologically speaking, how long ago the Wisconsin ice melted off the northeastern United States. This date is generally set at from 20,000 to 35,000 years ago. The moraines of northeastern Rhode Island were formed while the ice still lay over northern New England and are a few thousand years older. Their age is probable somewhere between 30,000 and 60,000 years.

J. C. Hilden, of Parsons, Kans., has been spending several days in Washington on business.

GOVERNMENT EXPERTS WELL KNOWN TO MINING MEN

Photo by Harris & Ewing

FRANK C. SCHRADER
Geologist

Frank Charles Schrader was born in Sterling, Ill. He received his early education in the public schools of that city. Later he attended the University of Kansas and was graduated from that institution in 1891 with the degree of A. B. He then went to Harvard, where he was graduated with the degree of A. M. in 1894. During the two years that followed he taught geology at Harvard and then came to the Geological Survey and has been with that bureau continuously since. Mr. Schrader has an acquaintance with mining men in the United States as extensive as has any man in the government service. Following is a brief sketch of the work that he has done in the metal mining regions of continental United States and Alaska:

Mr. Schrader was a member of the Geological Survey party which went into Alaska over the Chilcoute Pass and camped on the site of the Klondike gold field which was discovered a little later the same year. Since the Klondike is on Canadian territory they made no examinations there, although they were aware that there was some gold in that region. The party, of which Mr. Schrader was a member, crossed into American territory and made studies at Forty-Mile Creek, Eagle Creek and Birch Creek, which were the main mining camps in that part of Alaska in 1896. It was while they were engaged in this work that the first report of the remarkable discoveries in the Klondike reached the party of geologists. Every man in the party was able to withstand the tremendous temptation to throw up the government work and take his chance in the new gold region. Equipped with their knowledge of mining and geology there is little question that many of the members of this party could have been able to locate valuable properties. They were so near the scene of the strikes that they could have been among the first on the ground, but rather than be disloyal to the trust that had been placed in them by the government, the geologists did not allow the Klondike fever to interfere with their work.

The following year, which was 1897, Mr. Schrader was engaged in geological work at Silver City, Delamar and Seven Devils, Idaho. He also made an examination of certain regions in the Chiracaucau Mountains in Arizona.

In 1898 Mr. Schrader was detailed as a geologist to the United States Army expedition which made an inspection of the Copper River district of Alaska. He was in charge of a part of the expedition while in the interior. His party went over the Valdez Glacier with pack trains, and came down the Copper River.

An adequate appropriation was furnished the Geological Survey in 1899 for the continuance of the Alaskan work and Mr. Schrader was put in charge of the party which investigated the geology of the Arctic slope of Alaska along the Chandlar and Koyukuk Rivers.

In 1900 Mr. Schrader was sent back to the Copper River. Some detailed investigations were made necessary by the number of mineral deposits that were being opened.

One of the most remarkable trips ever taken by a Survey party was that of 1901, when Mr. Schrader and other geologists made an investigation of the region bordering on the Arctic Ocean. The party went in via the Yukon and dog-sledded from White-Horse to Bergmann, which is above the Arctic Circle. As soon as the ice broke up the party ascended the John River to its head and portaged over the mountains and descended the Anaktuvuk River to the Arctic. After extensive reconnoissance they decided to make the ocean trip down the coast to Nome. The trip was started in canoes and Eskimo boats of walrus skins, but later at a settlement they were able to buy a whale boat, in which they finally reached Nome.

An interesting incident took place a few days after the party arrived at Nome. An incoming ship was sighted from the harbor, but owing to a storm which was in progress it was impossible for it to make port. Through glasses it was seen that the ship's flag was flying at half-mast. News of the attack on President McKinley had reached Nome and it was taken for granted that the half-masted flag on the ship indicated that the President had died. With no other evidence than this a memorial service was held in the town hall, which was attended by practically every resident of Nome. Several days later, when the boat was able to dock it was ascertained that their surmise had been correct.

In 1902 Mr. Schrader was sent back to the Copper River and confined his work largely to the study of the geology of the upper regions of the Copper and Tanana Rivers.

During the several years spent in Alaska Mr. Schrader became acquainted with a large number of operators in the mining districts of that territory. Since 1902 his work has been confined to continental United States.

In 1904 he made a geological investigation of the oil and gas fields in the Independence quadrangle in Kansas. He also did similar work in Oklahoma. In 1905 he worked in the Durango-Gallup district of Colorado and New Mexico and studied the copper deposits in the Zuni and Nacimiento mountains in New Mexico.

In 1906 and 1907 he studied the mineral deposits of the Mohave Country in Arizona. In 1908 his work was confined to the Libby, Nine-Mile Creek and Thompson Falls district of Montana, and the Wallace district of Idaho. In 1909 he did field work in Santa Rita and Patagonia districts in southern Arizona, and in the Clear Water District of Idaho.

The whole field season of 1910 he spent in the Jarbidge region of the Elk Mountains of Nevada.

During the three years following most of Mr. Schrader's attention was given to the mining regions of Nevada. He has made careful studies at Wonder, Rawhide, Bobard, Goldfield, Antelope, Rochester, Fairview, Bernice and Alpian districts. He also made an examination of the Wind River district of Wyoming.

Last year Mr. Schrader made an extensive trip in Colorado, during which he made geology studies in the Durango, Leadville, Cripple Creek and other districts.

He has been chief examiner of the properties and a witness in important mining cases in the Federal Courts of New York, Chicago, Denver, Spokane, Santa Fe and elsewhere.

UNITED STATES INCREASES AMOUNT OF HIGH-GRADE ASBESTOS MINED

The United States marketed a domestic production of 1,731 short tons of asbestos in 1915, valued at $76,952, according to the U. S. Geological Survey. As compared with the production of 1914, this represents a gain of 484 tons, or 39 per cent, in quantity, and of $57,987, or 306 per cent, in value. The great increase in value was due to the high grade of the material produced.

The producing States were Georgia, Arizona, and California. There were three important producers, two in Georgia and one in Arizona, besides several small producers in California. Georgia had much the larger production, a gain of 22 per cent in 1915 over 1914, but yields only mass fiber of the hornblende variety, which is relatively of low grade, cannot be spun, and is practically all milled to one grade suitable for use in the manufacture of fireproof material. Arizona produces chrysotile only of the cross-fiber type and of spinning grade. The production of Arizona in 1915 was more than 10 times the quantity produced in 1914 and this accounts for the much greater increase in value than in quantity, as compared with the total output for 1914.

The average annual production of asbestos in the United States (for the last 26 years) from 1890 to 1915, inclusive, has been 1,470 short tons, ranging from a minimum of 50 tons in 1893 to a maximum of 7,604 tons in 1911. In 1911 and 1912, when there was a large production in Vermont, the total value of the output exceeded that of the production in 1915. But on account of the high grade of the Arizona asbestos the average value per ton in 1915 was $44.46, against $15.77 and $19.98, respectively, in 1911 and 1912.

ASBESTOS MINING IN ARIZONA HAS PROMISING FUTURE

The asbestos industry of Arizona is developing steadily, according to information reaching the U. S. Geological Survey. Production began in 1914 and increased more than tenfold in 1915. The Arizona Asbestos Association is the only producer.

The shipments have all been as No. 1 crude, and in the mining a large tonnage of milling rock of shorter fiber has been accumulated. A small experimental mill has been erected and a road completed to the mine, where more than 1,000 feet of tunnels have been developed in the canyon walls. Shipments are said to average a ton a day, going out on burros to Globe and to Rice on the Arizona Eastern Railroad.

The success of the Ash Creek mine has greatly encouraged prospectors and many claims, estimated at approximately 500 have recently been taken up.

Arizona is a promising asbestos field and, with the development of greater facilities for transportation, the output is destined to be much larger than now. The high grade of the material will always keep it in lively demand, especially for use in electrical appliances. The method of mining is in strong contrast to that of Canada, where open-quarry methods obtain. Notwithstanding the active development of the asbestos interests in south-central Arizona, there has been but little activity in the Grand Canyon region, where this valuable asbestos was first discovered.

Current Federal Legislation

During the present session of Congress 22,946 bills have been introduced; 16,534 of these were presented by members of the House and 6,412 by Senators.

The following bills of interest to the mining industry have been introduced during the last month:

S. 6230, by Mr. Chamberlain. This bill provides for the creation of a Council of Executive Information for the Coordination of Industries and Resources for the National Security and Welfare, which is to consist of the Secretary of War, the Secretary of the Navy, the Secretary of the Interior, the Secretary of Agriculture, the Secretary of Commerce and the Secretary of Labor. The bill provides that the Council of Executive Information shall nominate to the President, and the President shall appoint, an advisory commission consisting of not more than seven persons, each of whom shall have special knowledge of some industry, or the development of some natural resource, or be otherwise specially qualified, in the opinion of the council to perform the duties prescribed. The members of the advisory commission shall serve without compensation, but allowed actual expenses of travel and subsistence when attending meetings of the commission or engaged in investigations pertaining to its activities.

It shall be the duty of the Council of Executive Information to supervise and direct investigations and make recommendations to the President and the heads of executive departments as to the locations of railroads with reference to the frontier of the United States so as to render possible expeditious concentration of troops and supplies to points of defense, the coordination of military, industrial and commercial purposes in the location of extensive highways and branch lines of railroad, the mobilization of military and naval resources for defense; the increase of domestic production of articles and materials essential to the support of armies and of the people.

The sum of $200,000 a year is appropriated to carry on the work outlined in this bill.

S. 6308, by Mr. Ashurst. This bill authorizes the Secretary of the Interior to lease, for production of oil and gas, ceded lands of the Shoshone or Wind River Indian Reservation in the State of Wyoming.

S. Res. 217. By Mr. Hitchcock. The resolution reads as follows:

Resolved, That the Federal Trade Commission be, and it is hereby requested to make an immediate investigation into the operations and accounts of the leading companies producing anthracite coal, for the purpose of ascertaining the facts concerning the recent increase in the price of anthracite coal, and report the same to the Senate during the present session of Congress, if possible.

Resolved, That the commission be requested to include in its report a showing of the relation between the cost of labor and the price of anthracite coal prior to said increase and at the present time.

The resolution was passed by the Senate.

S. 5992, by Mr. Pittman. This bill permits the Secretary of the Interior to grant permits to corporations to remove timber from the public domain for mining and domestic purposes in other States than those in which such corporations are incorporated.

S. 3444, by Mr. Martine. Authorizes the Secretary of Agriculture to investigate and report to Congress the expediency of having the Government set apart a tract of land in the District of Columbia to permit each State and territory to construct and maintain a building for the installation of a permanent exhibit of its resources. This bill has been favorably reported by the Committee on Industrial Expositions.

H. R. 407 has been passed by the house and reported favorably by the Senate Committee on Public Lands.

This bill, as amended, provides for stock raising homesteads of 640 acres of such lands as shall be designated by the Secretary of the Interior as "lands the surface of which is, in his opinion, chiefly valuable for grazing and raising forage crops, do not contain merchantable timber, and are not susceptible of irrigation from any known source of water supply."

All entries must be on "unreserved and unappropriated public lands" and patents under this act "shall be subject to and contain a reservation to the United States of all the coal and other minerals in the lands so entered and patented, together with the right to prospect for, mine and remove the same.

"The coal and other mineral deposits shall be subject to disposal by the United States in accordance with the provisions of the coal and mineral land laws in force at the time of such disposal."

Any person qualified "shall have the right at all times to enter upon the lands entered or patented, as provided by this act, for the purpose of prospecting for coal or other minerals therein," being liable to the entryman for all damage to the permanent improvements or crops.

(It may well be questioned whether the words "unreserved and unappropriated" will protect an entryman in possession of a mining claim at the time the stock-raising homestead filing is made.—*Ed.*)

Owing to the coming of the conventions of the political parties last month, there was little work done in Congress during more than half of the time since the last issue of the Journal. In contrast with the lack of activity earlier in the month both Houses are now working under the greatest pressure. The appropriation bills have right of track over other legislation. The administration's program is certain to come next in order. The chances for many important bills being reached is growing less and less.

For weeks Senator Myers, of Montana, chairman of the Public Lands Committee of the Senate, has been bringing all pressure within his power to bear upon the Senate in an effort to secure consideration of the so-called oil land leasing bill. The name by which this bill is commonly called is a misnomer to the extent that it does not mention the various other minerals which are included in the bill in addition to oil. Coal is not included in this bill but Senator Myers has another bill covering it. This bill is not nearly so far advanced as is the oil land leasing bill. It still has to pass through the committee stage.

Senator Myers had hoped to effect an arrangement whereby the oil land leasing bill could be taken up in the near future but as the month closes he is not sanguine as to the bill's chances for early consideration.

No bills were referred to the Senate Committee on Mines and Mining during the month. No meeting of the committee was held.

With the exception of some slight progress by the sub-committee of the House Committee on Mines and Mining, which is considering H. R. 175, a resolution by Mr. Randall, of California, looking to conservation of coal lands, nothing has been done during the month by the House Committee on Mines and Mining. The question of a revision of the mining laws continues to be the subject of most interest on the House side of the capital. Letters in regard to this subject continue to reach Chairman Foster of the committee and Representative Taylor of Colorado. Mr. Taylor is preparing a statement on this question which will be published in the August Journal. The legislative jam practically makes impossible any thought of action on the Foster bill at this session. Some members of the committee believe the bill should be pushed at this session but in the face of the opposition and the congested state of the calendar, it is practically certain that no action will be taken at this session.

H. R. 12544. Meeting in executive session, June 27, the House Committee on Indian Affairs decided to report this bill favorably. The amendments proposed by the four large coal mining companies that are mining in the segregated Indian lands were added to the bill.

Dorset Carter, president of the Folsom-Morris Coal Mining Company, and J. H. Hibben, who is with the M. K. & T. Coal Mining Company, appeared before the committee during the month and set forth in greater detail than had been done at any previous hearing, just the position of the coal mining companies which they represent.

At the last hearing Mr. Carter made it very plain he did not oppose or advocate the bill, but in case it is to be passed there are certain rights in which the coal mining companies should be protected. He declared that if the lands were sold that an individual purchaser might claim the same right of administration as is now enjoyed by the Interior Department.

It also was pointed out at the hearing that the people living in the five counties, which comprise the greater part of eastern Oklahoma, are very anxious that arrangements will be made whereby the coal and asphalt deposits in the Choctaw and Chickasaw reservations may be developed. It was shown that this area comprises 445,000 acres, and it was also admitted that the mining companies now engaged in mining in this region are better equipped to operate these mines on an economical scale than any others which might become interested.

Some of the opposition to this bill came from the desire to prevent Indian holdings being reduced to an easily convertible fund. In case their assets should be reduced to cash it then would be an easy matter, where a majority of the members of the committee favored it, to disburse this money. Other members of the tribe having claims against it, then would have nothing against which they could recover.

Owing to the extremely crowded condition of the calendar in each House the chances of the ultimate passage of this bill are not bright.

Bureau of Mines Publications

The Bureau of Mines just has issued the following publications:

Bulletin 92. The feldspars of the New England and North Appalachian States, by A. S. Watts. 1916 181 pp., 8 pls. 22 figs.

Bulletin 93. Miners' nystagmus, by F. L. Hoffman. 1916. 67 pp.

Bulletin 96. The analysis of permissible explosives, by C. G. Storm. 1916. 88 pp., 3 pls., 7 figs.

Technical Paper 122. Effects of atmospheres deficient in oxygen on small animals and on men, by G. A. Burrell and G. G. Oberfell. 1915. 12 pp.

Technical Paper 125. The sand test for determining the strength of detonators, by C. G. Storm and W. C. Cope. 1916 68 pp., 2 pls., 5 figs.

Coal-mine fatalities in the United States, 1915, compiled by A. H. Fay, 1916. 80 pp., 3 figs.

Wood Tin in Place at Battle Mountain

The deposit near Battle Mountain is the only one known in the United States in which wood tin has been found in place. The Mexican deposits are apparently very similar to those near Battle Mountain

GOVERNMENT EXPERTS WELL KNOWN TO MINING MEN

Photo by Harris & Ewing

GEORGE. S. POPE

In Charge of Government Fuel Inspection, Bureau of Mines

George S. Pope was born in Kane, Ill., 1881. His early education was secured in the public schools at Kane and Carrollton, Ill. After completing his public school course, he attended the University of Illinois for four years, where he specialized in fuel work. Since coming to Washington he has taken supplemental work along the same line at George Washington, University.

Mr. Pope was one of the first employes associated with the Government fuel-testing plant at St. Louis. After serving in this plant until December, 1906, he was summoned to Washington to assist in the inauguration of a system of purchasing coal for the Government under the specification method, and in establishing a laboratory for the analysis of coal. During the Jamestown exposition Mr. Pope was connected with the fuel-testing plant there. For the last six years he has been special engineer in charge of Government fuel inspection, which is a division of the work of the Bureau of Mines.

The Government purchases $8,000,000 worth of coal annually. Of this $7,000,000 worth is tested by the Bureau of Mines. He is chairman of the committee of the American Society for Testing Materials, which was appointed to draft standard specifications for purchase of coal. He is the author of a number of bulletins dealing with sampling and purchasing of coal.

THROAT TELEPHONE APPLICABLE TO WAR USES, IT IS DECLARED

Application of the throat telephone to military operations is urged in the following letter to George S. Rice, chief mining engineer of the Bureau of Mines:

"I may be taking liberties in writing you in regard to military matters. However, it is one in which I am very much interested. I am, therefore, writing you in regard to the application of the throat telephone used for rescue work to military purposes.

"There are a number of applications where the throat telephone with reel connection as designed and used by the Bureau, may be very serviceable. As an illustration, an observer posted close to the enemy's trenches for the directing of artillery fire must be in constant touch with the artillery. He must do this as quietly as possible so as not to betray his presence. The throat telephone and reel can be attached to his belt, and the reaching of his destination will be much simplified due to the light weight and principle of the reel. Communications can then be transmitted to the base without making distinct articulations, which would be an advantage. This is also applicable to transmitting the messages of men who are spying close to the enemy's quarters. The light weight of the reel will make it possible for a man to carry sufficient wire to go a long distance into the enemy's territory and report without opening his mouth.

"This telephone, having been developed by the Bureau, may be credited to the Bureau as a contribution to military science.

"At Springfield the Director advised me that he had been appointed to organize the mining engineers of the United States for preparedness, and with your approval, I would suggest that this be brought to his attention."

Dr. F. L. Ransome and Mrs. Ransome and Dr. Arthur C. Spencer and Mrs. Spencer were the guests of Dr. George Otis Smith, Director of the Geological Survey at a dinner at the University Club on June 9. The dinner was given in honor of the twentieth anniversary of the date on which the Drs. Smith, Ransome and Spencer took the first civil service examination ever given by the government for the position of geologist.

HOME INSPECTION MADE A PART OF WELFARE WORK AT UTAH PLANTS

American Smelting and Refining Company Names Miss Rose Korous to Advise with Housewives in Health and Sanitary Matters— Utah Prospectors May Have Samples Analyzed Gratis— Gemmell Becomes Director in Utah Copper Company

By A. G. Mackensie

The American Smelting & Refining Company has established a system of inspection for the homes of its workers at its Garfield and Murray plants in Utah and has engaged Miss Rose Korous to have charge of the new work. Miss Korous resigned her position as supervisor of school nurses for the Salt Lake City Board of Health June 15 and will begin her duties with the company July 1. This action is an extension of the company's welfare work among employes and an important part of the duties of Miss Korous will be to advise wives of the company's workers regarding modern methods of sanitation and otherwise guarding the health of their families. She will also supervise the company's emergency hospitals.

TO ANALYZE ORES

The Utah Chapter of the American Mining Congress is planning to arrange, with the cooperation of the Utah State Conservation Commission and the State School of Mines, to assist prospectors of the State by giving them free qualitative analyses of mineral specimens, the determinations to be made in the laboratories of the State School of Mines. A special winter course for prospectors in metallurgy, mineralogy, geology and mining is part of the plan. It is not proposed to compete in any way with commercial chemists and assayers. The School of Mines will make merely qualitative tests of specimens and will advise the prospector whether his specimen contains mineral in commercial quantities and refer him to a commercial chemist or assayer for quantitative determinations. It is hoped to obtain valuable data regarding the location of the mineral resources of the State in connection with the plan as well as to assist greatly the development of the industry. It has been found that prospectors frequently discard specimens believed to contain valuable mineral because they do not desire to spend money for a test on an uncertainty. This is especially true with respect to the rarer minerals.

GEMMELL MADE DIRECTOR

Announcement was made in Salt Lake City, June 6, that R. C. Gemmell, general manager of the Utah Copper Company, had been elected a director of the company, and that John M. Hayes, assistant secretary and cashier, had been elected treasurer of the company. Mr. Gemmell is Governor of the Utah Chapter of the American Mining Congress, and Mr. Hayes is an active member of the Chapter's board of directors.

HELP TRAINING CAMP

Utah mining men are active in the preparedness movement in the State and are assisting materially in the preparations for the Citizens Military Training Camp, to be held at Salt Lake City, August 21 to September 16, 1916. Among well-known mining men who are assisting the movement are R. C. Gemmell, C. W. Whitley, Thomas Kearns and William Wraith, each of whom is a director of the Utah Chapter. Some of the leading companies have given employes the privilege of attending the training camp on full pay and individual mining men have made substantial cash subscriptions to defray preliminary expenses for the camp. Mr. Wraith is one of the Utah members of the Naval Consulting Board.

COAL OPERATORS MEET

The summer meeting of the Rocky Mountain Coal Mining Institute, composed of men engaged in coal mining in Utah, Colorado, New Mexico and Wyoming, was held at Salt Lake City June 14 and 15 with about 200 members and their families in attendance.

Visiting delegations were met at Castle Gate, Utah, the morning of June 13 by Utah members and the day was passed in an inspection of the important coal mines of Carbon County. The meeting at Salt Lake was addressed by Governor William Spry, of Utah; Mayor W. Mont Ferry, of Salt Lake City; J. E. Pettit, State Coal Mine Inspector for Utah; John McNeil, of Denver, and F. W. Whiteside, of Denver. Mr. Pettit's address was on "Safety First." Mr. Whiteside's on "Explosives Used in Coal Mining," and Mr. McNeil's address was to young men engaged in the business, giving results of his observations and long experience in coal mining. Mr. McNeil was one of the first coal mining operators of Colorado and is still actively in the business.

Officers of the Institute are: A. C. Watts, of Salt Lake City, president; J. C. Roberts, vice-president for Colorado; F. R. Weitzel, vice-president for New Mexico; A. H. Cowie, vice-president for Utah; W. D. Brennan, vice-president for Wyoming; F. W. Whiteside, of Denver, secretary-treasurer.

An enjoyable program of entertainment was prepared for the visitors.

The matter of including the states of the Northwest in the Institute was presented for discussion at the meeting and will receive further consideration at the annual business meeting of the Institute, which will take place in the fall.

That the prices of copper and zinc will remain around their present levels for a considerable period of time, due to the demand, and that silver will sell for higher prices, due to the increasing need of the world for hard money, were opinions expressed recently by D. C. Jackling, of the Utah Copper Company.

In discussing his impressions relative to the copper market, Mr. Jackling said:

"There is no question that in time copper prices will seek a normal level. For a long period, however, the prices of copper will follow the habits of that metal for the last two years, during which time the tendency has been upward. There is nothing of which I can learn that indicates a recession of prices. The metal will undoubtedly sell lower in the future, but that will not happen during the present year.

"There is a demand for all of the available output, with every reason to believe that this demand will continue throughout the year. I feel hopeful for very good copper prices for a considerable time in the future.

"Zinc is practically in the same position as copper. The same thing can be said regarding the demand for that metal, and, as a consequence, its future prices.

"Students of world conditions believe that silver will sell higher, due to an increasing demand for hard money throughout the world. It is well known that there is not enough gold with which to transact business, and the paper money, which has been issued in European countries, is even now depreciating in value and is being replaced by silver coin. The demand for silver from European mints is heavier than it has been in years and may be expected to be still heavier at the conclusion of the war.

"The future for all of the metals is bright, indeed, according to the best opinion of those in a position to know."

There will be spent in the neighborhood of $2,500,000 in improvements in the mine and mills of the company in line with the policy that the company has heretofore been following. A large leaching plant will be constructed this summer to treat some 40,000,000 tons of carbonate copper ores. The acid will be supplied by the sulphuric plant now under construction.

B. S. Butler and Dr. F. F. Hintze of the Geological Survey arrived at Salt Lake City, June 14, to begin their study in connection with a professional paper for the Cottonwoods-American Fork mining area, of Utah, as requested in the petition recently presented to the Survey by mining men of Utah, acting through the Utah Chapter of the American Mining Congress. Messrs. Butler and Hintze established their headquarters in Big Cottonwood Canyon and began their work at once. The region under consideration is already a considerable producer and is regarded as one of great possibilities. The formation is unusually complex and the work undertaken by the Survey will be of great value to the operators of that region.

IMPROVEMENT IN MANAGEMENT OF FORESTS, SAYS MACBETH

Ravenel Macbeth, secretary of the Idaho Mining Association has this to say with regard to forestry relations:

"We have found, in our relations with the Forest Reserve officials, that the personal equation enters, to a large extent, into the matter. We have found in some sections prospectors have been encouraged in their work, whereas, in other sections these officials have failed to give such encouragement—in fact, have so strictly interpreted the provisions of the regulations, that prospecting has been hampered. We would state, however, that since the organization of this Association in 1913 a much better condition has existed and that constant improvement is being noted by the mining men.

"Formerly, in the matter of an examination to secure patent, officials who had no knowledge of the geological conditions existing in the section in which the property was located were appointed to make examinations and frequently, as a result of ignorance, reported adversely, but, owing to vigorous representations made to the Department by this Association, such examinations are now made by competent mineral inspectors.

"At present we have taken up with the Department the matter of withdrawing certain sections in small areas, over which sheep are now permitted to graze, for the use of prospectors who have found it impossible to prospect in certain sections of the State owing to the sheep having ccaned up the country and not leaving any feed for their stock."

THE
MINING CONGRESS
JOURNAL

PUBLISHED EACH MONTH BY
THE AMERICAN MINING CONGRESS.
Munsey Building. Washington, D. C.

Subscription Rate, per year............. $2 00
Single Copies.......................... .20

Entered as Second Class Matter January 30, 1915, at the Postoffice at Washington, D. C.

JULY, 1916

EDITORIALS

VICIOUS THEORY ADVANCED IN TAVENNER BILL

The labor leaders in Congress, presumably with the approval of the labor organizations, are making a persistent fight to secure the passage of the Tavenner Bill, H. R. 8665.

The bill reads as follows:

> "Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That it shall be unlawful for any officer, manager, superintendent, foreman or other person having charge of the work of any employe of the United States Government to make or cause to be made with a stop-watch or other time-measuring device or system a time study of any job of any such employe between the starting and completion thereof, or by the movements of any such employe while engaged upon such work. No premiums or bonus or cash rewards shall be paid to any employe in addition to his regular wages, except for suggestions resulting in improvement or economy in the operation of any Government plant
>
> "Sec. 2. That any violations of the provisions of this act shall be deemed a misdemeanor and shall be punished by a fine of not more than $500 or by imprisonment of not more than six months, at the discretion of the court."

The bill applies only to Government employes, but is intended to fix the standard for employment in all lines. It makes possible the lowest efficiency and in effect forbids the employer the right to discover whether the service which he must pay for is being rendered or not.

Why would it not be equally reasonable and just to forbid the employe from counting the money which he receives for his work. My employer is forbidden to ascertain the amount of service which my mood prompts me to render as a day's work. I am prohibited from counting the money which his mood prompts him to give me as payment.

Why should not the groceryman be protected against the reweighing or the recounting by his customers of the goods sold instead of being supervised by a government inspector of weights and measures?

This fight is based on the theory that every man who is willing to work is entitled to a living and that if the whole number of wage-earners shall do all the work possible there will not be enough work to provide continuous employment for all, and therefore the interest of all wage-earners requires that none shall do so much work that there will not be enough left undone to require the employment of all others.

This theory is vicious to the extent that it makes for inefficiency. In this country the higher the efficiency the greater the demand. Are we to frame laws to protect against fraud in the purchaser of one kind of service and laws to protect fraud in another? Are we to frame laws against efficiency in order that all men may find employment by the process of the highwayman, who takes without compensation, or shall we form laws looking to that efficiency which will command the world's markets and not only make work for all, but puts labor at such a premium that the natural law of supply and demand will enable him to dictate industrial conditions? Avaunt with this hypocrisy which, while pretending to serve, robs the laborer of his earning power, his independence, his self respect and his dignity.

BINDING CONTRACTS ARE NECESSARY TO COLLECTIVE BARGAINING

The refusal of the miners of the Pittsburgh district to be bound by the New York wage scale agreement and the unrest which prevails in Indiana and elsewhere, raise many questions vitally affecting organized labor.

Is the authority of the duly accredited agencies of either side to a contract to be denied whenever the principals so decide and the parties to a contract accept its provisions only where it proves to be to their advantage? If so, it will be practically impossible to frame a contract so evenly balanced and providing such exact justice, or such equal advantage to both parties that neither will desire its repudiation.

The Constitution of the United States denies even to a State the right to impair the obligations of a contract. If such contracts are not to be binding except by mutually continuing consent, they cease to be contracts and there would seem to be no advantage in the wage scale conferences which cost so much of time and money.

If contracts made by the officials of a labor union on behalf of its members are to be repudiated there seems to be an end of the principle of collective bargaining.

The Mining Congress Journal believes in collective bargaining, but insists that a bargain must represent a meeting of minds between the parties authorized to act, where each party is at perfect liberty to accept or reject without the sacrifice of any existing right.

It is the inherent right of an owner to operate his coal mine with such agencies as he is able to provide free from outside interference.

Coal mine operators enter into a contract, the violation of which will make them liable for adequate damages with the representatives of an organization which is only to be binding upon the other party during its pleasure, and under threat that the operators' right to use any other agencies of production will be prohibited.

Such an agreement lacks two vital elements of every contract. It does not result from a meeting of minds and being binding on one party only is without adequate consideration.

Unless wage scale conferences are to result in binding contracts which effect a settlement of all points enumerated therein, the practice of collective bargaining will soon come to an end.

TRADE FOLLOWS EFFICIENCY

Sometime ago the Mining Congress Journal challenged the generally accepted theory that "trade follows the flag" and insisted that trade follows efficiency. Now comes Sr. Carlos A. Tornquist, of Buenos Aires, who has been called the Pierpont Morgan of South America with another theory: "The experience of the foreign banks in the Argentine Republic," he says, "has exploded the theory that 'trade follows the flag.' The results obtained there have shown that trade follows capital, and even in these early days of the investment of American capital in Argentine issues and enterprises there is ample evidence of the truth and soundness of the latter theory."

The Mining Congress Journal cannot change its conclusion even to meet the views of so eminent an authority. Capital always follows the course yielding the largest profit. European capital invested in South American countries, like all capital wherever invested in trade, will buy those goods which can be sold at the largest profit. All elements of trade must be considered, but in the end capital seeks the highest profit and will buy the goods which it can secure on the most favorable terms.

The flag will, or should, protect, and capital will follow the lead of highest profit into the markets of the world. The foreign market cannot be reached except on a competitive basis.

Trade follows efficiency.

MINERS NOT ENERGETIC IN LOOKING FOR MARKETS

Experts of the Geological Survey are at a loss to explain the length of time required for miners to learn of a shortage in the market. In some instances an active demand and high prices will exist for a year without greatly stimulating production.

This, of course, does not apply to gold, silver, copper, lead, zinc and metals having established markets. It does apply to a long list of valuable metals of which there are considerable deposits throughout the United States.

It apparently requires the actual solicitation of an ore buyer to arouse many miners to the fact that they can find a ready market for the mineral in their properties. While just at the present time ore buyers in considerable numbers are scouting about the country searching out supplies of various metals, many producers are not visited and large numbers who could be enjoying substantial profits are losing the best opportunity which has existed in thirty years for the sale of many minerals. The miner should be just as energetic in hunting out a market for his product as is the manufacturer.

GOVERNMENT EXPERTS SHOULD BE BETTER PAID

The mining industry is greatly interested in the present effort being made to increase the salaries of government employes. It is especially interested in seeing higher salaries paid to scientists engaged in economic work having to do with mining.

Owing to the unusual demand for high-class technical men, a large number of valuable specialists have left the service of the Bureau of Mines and the Geological Survey within the last eighteen months.

Even before the war began the government was acting as a training school for the private companies. The point has been reached where the standard of government work in the interest of mining cannot be maintained unless higher salaries are paid.

Years ago the Geological Survey salary was slightly in excess of that paid by colleges and universities for men of the same ability. Since, there have been very few increases in government salaries, the colleges and universities are now paying from twenty to forty per cent higher salaries than are paid in the government service.

Private enterprises have always paid better salaries for the same grade of talent.

The average salary of high-class specialists in economic work in Washington is between $2,500 and $3,000 per year. There are a few positions which pay $3,600, $4,000, and one or two as much as $5,000 per year. It is the desire, not to create a few high-salaried positions, but to have an appropriation which will permit of the payment of larger salaries to the majority of the members of the scientific staffs of the two bureaus doing mineral research work.

The fact that the public appreciates the class of talent in the government service is indicated by the very large number of separations which have taken place recently. A complete list of those who had left the service of the Geological Survey and the Bureau of Mines was printed in the April issue of the JOURNAL. To bring this list up to date it would be necessary to make considerable additions.

LITTLE GROUND EXISTS FOR ANY PESSIMISM

The decline in tungsten prices should not be the cause of any forebodings. While it is apparent that the supply of tungsten temporarily has exceeded the demand, yet there is reason to think that there has been some manipulation in prices which cannot be chargeable to the laws of supply and demand. With the steel industry as active as it is at present it is practically certain that there will be a good market for tungsten, probably for years to come.

Some are heralding the decline in

tungsten as a forerunner of the decline in other metals. Zinc prices are a little off, and this too is being pointed to as an indication of what may be expected from copper, silver and other metals. Little stock is taken in this argument by the government specialists who are keeping in intimate touch with the entire situation. As accurate data become more and more available it is found that the so-called war orders are consuming considerably less a proportion of the metals than it has been supposed. While the coming of peace will bring with it a period of uncertainty, during which it is impossible to predict just what may happen, the consensus of opinion here is that the rehabilitation of the industries in the countries at war insures a heavy demand for products of American metal mines for some years to come.

Legal Decisions

COVENANT AGAINST INCUMBRANCES

In an action by a vendee of coal land for damages on account of the breach of a covenant against incumbrances, by the existence on the land at the time of the conveyance of a subsisting but unused easement, the fact that the vendee bought the servient land as an outlet for the coal in other lands cannot be considered in estimating the damages, where there is proof that the vendor knew the land was bought for such purpose and such damages were not contemplated by the contracting parties and therefore not recoverable.

Smith *vs.* White (West Virginia), 87 Southeastern, 865, February, 1916.

RIGHT OF DIRECTORS

Until otherwise determined by a competent tribunal, the board of directors of a mining corporation whose election was certified in due form and who are in the actual control of the affairs of the corporation, must be recognized as its directors and the validity of their election cannot be adjudicated upon a petition for the removal of a case from a State court to a federal court.

Consolidated Interstate Callahan Mining Co. *vs.* Callahan Mining Co., 228 Federal, 528, p. 530.

CORPORATE FUNDS

A mining corporation organized to purchase, locate, lease or otherwise acquire mines, mining claims, mining rights, and to explore, work and develop same, and to quarry, mine, smelt, and prepare for marketing, ore, metal and mineral substances of all kinds, is not empowered or authorized to loan the corporate funds and receive interest thereon.

Riley *vs.* Callahan Mining Co. (Idaho), 155 Pacific, 655, p. 670, March, 1916.

See First National Bank *vs.* Callahan Mining Co. (Idaho), 155 Pacific, 673, March, 1916.

INTERESTED DIRECTOR VOTING

A resolution of a board of directors of a mining corporation passed at a meeting at which one of their number interested therein and necessary to a quorum is present and voting in favor thereof, is *prima facie* fraudulent and void.

Flanagan *vs.* Flanagan Coal Co. (West Virginia), 88 Southeastern, 397, p. 399, March, 1916.

APPOINTMENT OF RECEIVER

Where a mining corporation has in fact ceased to exist, whether from lapse of time, voluntary dissolution, judgment of forfeiture for negligent abuse of its powers, or where it is insolvent, or in imminent danger of insolvency, a court of equity has the undoubted right in a proper proceeding instituted by a creditor or a stockholder to appoint a receiver to administer the property.

Henderson vs. Palmer Union Oil Co. (California Appeals), 156 Pacific, 65, p. 66, March, 1916.

See Morgan *vs.* Dayton Coal and Iron Co. (Tennessee), 183 Southwestern, 1019, January, 1916.

LOCATION IN ALASKA

The location of a mining claim in Alaska under a power of attorney is valid if such power of attorney is duly recorded at any time before adverse rights accrue, or location is attempted to be made upon the same ground by another, and the statute does not require that the power of attorney shall be recorded before a location is made.

Cloninger *vs.* Finalison, 230 Federal, 98, p. 101.

OWNERSHIP OF ORES

The ownership of ore in a vein below the point of union with another vein is determined by priority of the surface location and belongs to the senior location in which one of the veins above the point of union has its outcrop or apex; and the rule applies whether such a vein has a separate apex or unites with still a third vein having its apex in the senior location.

Anaconda Copper Mining Co. *vs.* Pilot-Butte Mining Co. (Montana), 153 Pacific, 1006, p. 1008, December, 1915.

QUIETING TITLE

The owner of a lode mining claim is entitled to have his title quieted to the vein or lode below the point of intersection with the defendant's vein, where the plaintiff's vein and the defendant's vein each has passed outside of the vertical planes of their surface locations, where it was expressly found by a jury that the vein below the point of intersection had its apex within the surface boundaries of the plaintiff's claim.

Square Deal Mining Co. *vs.* Colomo (Colorado), 156 Pacific, 147, April, 1916.

MILL SITE

The owner of a lode mining location, who purchased a mill site location located by others upon the same land, is not estopped from subsequently claiming the mill site under the lode mining location, though the persons locating the mill site did so on the representations that the land was non-mineral in character, as the representations of the mill site locators cannot be imputed to the owner of the lode location, unless it appeared that he had procured the mill site location to be made.

Worthen Lumber Mills *vs.* Alaska-Juneau Gold Mining Co., 229 Federal, 966, p. 968.

INDIANA EMPLOYERS' LIABILITY ACT

The employers' liability act of Indiana, of March 2, 1911, as applied to a mine operator, is not unconstitutional as being violative of the Fourteenth Amendment, or of either Section 12 or Section 23 of Article 1 of the State Constitution.

Vivian Collieries Co. *vs.* Cahall (Indiana), 110 Northeastern, 672, p. 676, December, 1916.

OTHER THAN STATUTORY SIGNALS

The California statute (Statutes of 1893, p. 82), providing a code of signals for mining operations does not prohibit the use of additional signals to indicate that men are to be hoisted or lowered; but if, in fact, such signals were used, the engineer operating the hoist was bound, in the exercise of due care, to act upon them when they were actually given him and if by any means he was advised that a miner was about to ride up on the bucket it was his duty to act upon such information.

Gibson *vs.* Kennedy Extension Gold Mining Co. (California), 156 Pacific, 56, p. 59, April, 1916.

MINER WORKING IN DANGEROUS PLACE

Section 3508, Code of 1915, of New Mexico, does not prohibit a miner from remaining or working in a room where a portion of the roof requires timbers and supports in order to render it safe, so long as the particular place where he is working is a safe place, and does not require such timbers or supports; and he is not guilty of a violation of the section nor can he be charged with contributory negligence as a matter of law so long as he remains from beneath the particular portion of the roof which is unsafe and dangerous; and contributory negligence under such circumstances is an affirmative defense and the burden of proof is upon the operator to establish the fact.

Melkusch *vs.* Victor American Fuel Co. (New Mexico), 155 Pacific, 727, p. 730, February, 1916.

RIGHT OF STOCKHOLDER

The purpose of Section 588 of the Civil Code of California in giving a stockholder the right to examine the property of a mining company, is to arrive at the value of the property in which the stockholder is interested and that value is composed of two elements: Economical and uneconomical working of the mine, and the extent and richness of the ore body; and the statute expressly gives the right to take samples, as no valuation could be placed upon ore bodies in the absence of some test or assay.

Symes *vs.* Sierra Nevada Mining Co. (California), 153 Pacific, 710, p. 711, December, 1916.

QUESTION OF FACT FOR JURY

The question of the operator's negligence is one of fact to be determined by a jury, where an injury caused by the sudden lowering or falling of the cage in a shaft of a mine would not have happened if the machinery installed had been properly used and the rule adopted by the operator followed by the plaintiff and a fellow servant, but where the accident could not have happened if the operator had provided additional apparatus easily installed or provided additional rules.

Ducktown Sulphur, Copper & Iron Co. *vs.* Fortner, 228 Federal, 191

TAX ON RESULTS OF BUSINESS

A tax levied on a mining corporation under the income tax law of 1913 is not a direct tax on property because of its ownership where adequate allowance is not made for the exhaustion of the ore body, resulting from working the mine, but is in fact a true excise levied on the results of the business of carrying on mining operations.

Stanton *vs.* Baltic Mining Co., 240 United State, 103, p. 114

See Brushaber *vs.* Union Pacific Railroad Co., 240 United States, 1

Stratton's Independence *vs.* Howbert, 231 United States, 399, p. 413.

INCOME TAX LAW CONSTITUTIONAL

The income tax law of 1913 is not unconstitutional on the ground that it is not within the purview of the sixteenth amendment on the ground that it is not a tax on the net product, but in a sense somewhat equivalent to a tax on the gross product of the working of a mine by a corporation.

Stanton *vs.* Baltic Mining Co., 240 United States, 103, p. 112

See Brushaber *vs.* Union Pacific Railroad Co., 240 United States, 1.

INJURY FROM LOOSE CAR

It is actionable negligence in a mine operator to so manage the operation of its mine as to negligently cause or permit a loaded car to run down the track in a mine and upon or against a miner engaged in placing loaded cars upon the cage to be hoisted to the surface.

Parks *vs.* Central Coal & Coke Co. (Missouri), 183 Southwestern, 560, February, 1916.

MINER MAY RECOVER

It is the duty of a coal company furnishing the means by which its employes are carried to and from their work to exercise ordinary care to provide reasonably safe methods of transportation, and if an employe is injured by defects in the track, or by the unmanageable character of a mule, or by other causes attributable to the negligence of the coal company, he has a right to recover of the company for such injuries.

Taylor Coal Co. *vs.* Miller (Kentucky), 182 Southwestern, 920, p. 921, February, 1916.

PROXIMATE CAUSE

In an action by a miner for damages for injuries received because of the alleged negligence of the mine operator, it must be shown that but for the operator's negligence in the respects charged the accident would not have happened; and the doctrine of intervening cause has primarily no reference to the conduct of the injured miner, but to some other responsible agency for which the operator was not responsible, intervening between the operator's negligence and the miner's injury, without which the accident would not have happened; but in such cases an intervening human agency may not relieve an intelligent operator, for if his original wrong concurred with such intervening cause, and both acted proximately at the same time in producing the injury, then either or both may be held liable.

Johnson *vs.* Plymouth Gypsum Plaster Co. (Iowa), 156 Northwestern, 721, p. 724, March, 1916.

RIGHT TO LIEN ON PLACER CLAIM

Under Section 4028, Colorado Revised Statutes of 1908, the words "deposit yielding metals or minerals," clearly include gold-bearing sands or gravels, which are commonly known as placers, and the provisions of the section giving liens to persons of designated classes, are, by this section, made to apply to persons who shall furnish materials or machinery "upon, in or for" any improvement, "of or upon such mine, deposit," etc., and this includes placer mines.

Colorado Gold Dredging Co. *vs.* Stearns-Roger Manufacturing Co. (Colorado), 153 Pacific, 765, January 1916.

TAX ON OIL PRODUCTION

The power of the legislature to distinguish, select and classify objects of taxation has a wide range of discretion, and while the classification must be reasonable, yet there is no precise rule of reasonableness and there cannot be an exact exclusion or inclusion of persons and things. However, the classification adopted must always rest upon some difference which bears a reasonable and just relation to the act, in respect to which the classification is proposed, and can never be made arbitrarily and without any such basis. Accordingly, a statute levying one rate on ores bearing lead, zinc, jack, gold, silver, copper or asphalt, and which omits a gross production tax on coal, is not repugnant to the provision of the constitution of Oklahoma to the effect that taxes shall be uniform upon the same class of subjects. That mining property or the business of mining may be placed in a class by itself and taxed by some method peculiarly appropriate to that class is a valid exercise of a constitutional right on the part of the legislature, and it is competent for the legislature to arrange and divide the various subjects of taxation into different classes, providing the tax is uniform upon all those belonging to the same class and upon which it operates.

Gross Production Tax Wolverine Oil Co., *In re* (Oklahoma), 154 Pacific, 362, p. 367, January, 1916.

MORTALITY TABLES AS EVIDENCE

In an action by a miner for damages for a personal injury which impaired his power to earn money it is competent to use mortality tables in proof of the number of years which the claimant may be reasonably expected to live, although such tables do not prove how many years the miner would have been able to earn money.

Nelson *vs.* Black Diamond Mining Co. (Kentucky), 181 Southwestern, 341, p. 345, January, 1916.

DAMAGES FOR MINERS

A verdict for $10,000 for fractures to one arm of a miner is so flagrantly excessive as to furnish ground for reversal.

Indian Creek Coal Co. *vs.* Walcott (Kentucky), 182 Southwestern, 431, p. 632, February, 1916.

DAMAGES FOR INJURIES

A verdict for $5,000 is not excessive where the proof showed that the injured miner was 40 years of age at the time of his injury and was earning about $75 per month, that he suffered a compound fracture of one leg endured much pain, and the broken leg was some shorter than the other, and he could not bear any weight on such injured leg, and that the knee joint at the time of the trial was stiff, and since the injury he had not been able to do any considerable work.

Johnson v. Plymouth Gypsum Plaster Co. (Iowa), 156 Northwestern, 721, p. 727, March, 1916.

The
Nineteenth Annual Convention
OF THE
American Mining Congress

LA SALLE HOTEL, CHICAGO, ILLINOIS
NOVEMBER 13, 14, 15, 16, 1916

Chicago by reason of its central location, its spirit of cooperation, its interest in the various branches of mining and its ample hotel accommodations is an ideal location for a great mining convention. The convention will be divided into sectional meetings each devoted to a special branch of mining, thus providing for ample discussion of every important question and the making of comprehensive plans for the benefit of mining. The greatest meeting of mining men ever assembled in this country is practically assured.

Current Traffic Developments

Coal and Coke Cases Decided

The highly important cases dealing with coal and coke rates from Virginia points have been decided. The commission makes the following synopsis of its rulings in these cases:

1. Reasonable divisions to the Interstate Railroad out of the through rates involved fixed at 15 cents per ton on coal and 18 cents per ton on coke.
2. The provisions of section 16-A of the act regarding the rehearing of cases by the Commission does not contemplate that the rehearing be completed and a supplemental report and order made before expiration of original order.
3. Exhibits compiled by Commission's examiners of accounts, offered in evidence at a duly appointed hearing, without objection from interested parties, properly identified by the official stenographer and filed in the record along with all the other evidence in the case, are lawfully a part of the record.
4. Rates fixed under federal authority must yield "just compensation," which comprehends a reasonable return upon the value of property devoted to public use.
5. Where the traffic involved is only a portion of the traffic moving over the originating division, and only a small portion of the coal coke traffic moving over the line, which, in turn, is only a small part of the entire coal and coke tonnage moving over the entire system, a claim that the rates on the traffic involved are confiscatory is not established until it be shown that the rates on the other traffic moving over the originating line are reasonably remunerative and that the revenue derived from the other coal and coke traffic moving over the line is adequate.
6. Commercial competition a controlling factor in the adjustment of the rates here considered.
7. Reasonable rates on coal from St. Charles and Appalachia are found herein to be such as do not exceed the rates contemporaneously in effect from Middlesboro-Jellico to the same destinations by more than the differential herein fixed. Reasonable coke rates for the future will be such as do not exceed $2.50 per ton to Chicago with proportionately scaled rates to other destinations involved.
8. St. Charles included in Appalachia group and a differential from this group of 15 cents per ton over Middlesboro-Jellico rates on coal fixed. Coal Rates from Virginia Mines, 30 I. C. C., 635, modified.
9. The Appalachia group rate to be applied from operations on the Interstate Railroad.

May Exceed Group Rate 5 Cents Per Ton

In case No. 6492, the Brush Creek Mining & Manufacturing Company *vs.* the Louisville & Nashville Railroad Company the Commission sums up its ruling as follows:

1. Carload rates of the Cumberland Railroad and the Louisville & Nashville Railroad on coal from mines on the Cumberland Railroad to the northwest and the southeast found not to be discriminatory because they exceed group rates of the Louisville & Nashville Railroad to and from the same territories from and to mines on that road, but found to be unreasonable to the extent that they exceed such groups rates by more than 5 cents per ton, and the defendants required to publish rates on that basis. Reparation denied.
2. Rates on inbound supplies to mines on the Cumberland Railroad not found to be unreasonable or discriminatory.

Rate Increase Not Allowed

In the mattter of coal to Missouri stations the proposed increased rates on bituminous coal in carloads from mines on the Southern Railway in Illinois and Indiana to stations on the Chicago & Alton Railroad in Missouri have not been justified, the commission holds and schedules under suspension were ordered canceled.

Complaint Dismissed

In case No. 8342, Marquette Coal Company *vs.* Pennsylvania Railroad Company, shipments of coal from Bolivar, Pa., to West Albany Transfer, N. Y., for beyond, reconsigned to the Albany Southern Railroad at Stuyvesant Falls, N. Y., via Hudson, N. Y., were moved to Stuyvesant Falls through Hudson and Hudson Upper, N. Y. Defendants applied a rate of $1.90 per ton applicable from Bolivar to Hudson, declining to apply a rate of $1.90 applicable to Hudson Upper. The Albany Southern Railroad was thereby required to pay the Boston & Albany Railroad a contract charge of 15 cents per ton for moving the shipment on its account from Hudson to Hudson Upper and deducted 15 cents per ton from complainant's price. A rate of 60 cents per ton was applied on coal from Hudson to Stuyvesant Falls and no rate from Hudson Upper. The Commission held, that the legal rate was the combination rate of $2.50 per ton based on Hudson and that defendants legally applied the $1.90 rate to Hudson. Complaint dismissed.

Refunds Ordered

In case No. 5650, Charles Becker, Trading as Wisconsin Coal Company *vs.* Pere Marquette Railroad, the Commission ruled:

1. The "reasonable time" within which consignees should have given orders for reconsignment at Milwaukee or Ludington so as to have avoided the charge for reconsignment extends from the day on which (passing) notice was mailed until noon of the second day thereafter.
2. Reconsignment charges assessed between December 18, 1912, and February 9, 1913, should be refunded if orders for reconsignment were given prior to arrival of cars at Milwaukee or within the "reasonable time" prescribed.
3. Reconsignment charges assessed at Ludington between February 9, 1913, and April 10, 1914, should be refunded if carrier failed to furnish passing notice at Toledo, or if complainant had given reconsignment orders within the "reasonable time," or prior to the arrival of the car.
4. All demurrage assessed during period of controversy, December 18, 1912, to February 9, 1913, must be refunded.
5. Demurrage charges, lawfully accruing and assessed from February 9, 1913, to April 10, 1914, must stand.
6. Reconsignment charges at Milwaukee, subject to the finding as to "reasonable time," should be assessed between October 17, 1912, and December 17, 1912, inclusive.

Milwaukee Loses Case

In case No. 6446, the City of Milwaukee *vs.* the Chicago, Milwaukee & St. Paul Railway Company, upon complaint by the city of Milwaukee that the rates on anthracite coal in carloads from Pennsylvania mines to Milwaukee are unreasonable and unduly discriminatory; the Commission held:

1. That neither the rates all rail nor those via the car ferries across Lake Michigan have been shown to be unreasonable or to discriminate unduly against Milwaukee.
2. That the across-lake rate for local delivery at Milwaukee, which is 25 cents higher than the proportional across-lake rate to Milwaukee on traffic destined beyond, has not been shown to discriminate unduly against Milwaukee. The complaint was dismissed.

Car to Car Transfer

In case No. 6399, the Lehigh Valley Coal Sales Company *vs.* the Lehigh Valley Railroad Company, the commission denied reparation on account of services performed by complainant in connection with the transfer of interstate shipments of coal from open cars to box cars at Buffalo, N. Y.

In its decision, the Commission said in part:

Although Canadian and western coal consumers may prefer its shipment in box cars, that custom does not make transfer from car to car transportation. The transfer herein involved was primarily for the commercial convenience of complainant and not a transportation service which defendant was required by the act to provide and furnish upon reasonable request therefor. The fact that defendant promised to reimburse complainant for the service the latter performed in the transfer of the coal from car to car and that defendant did provide an allowance of 15 cents per gross ton subsequent to such transfer do not, of course, constrain the Commission to find the allowance to be for a transportation service for which defendant may make an allowance.

From the facts of record it does not appear that the transfer of this coal from coal cars to box cars was a service of transportation which defendant was required to perform and for the performance of which by the owner defendant could lawfully pay an allowance. Manifestly, the Commission may afford relief only within the confines of the provisions of the law, no violation of which has here been proved. The complaint must be dismissed.

Sulphur Must Pay Higher Rate

In case No. 7546 of the Union Sulphur Company et al. *vs.* the Baltimore & Ohio Railroad Company, the Commission found that the increased rates on crude sulphur and brimstone from Atlantic ports to points in central freight association territory were found justified and denied that portion of Fourth Section Application No. 1772 for authority to continue rates on brimstone and crude sulphur from Baltimore, Md., to Cheboygan, Mich., which are lower than the rates contemporaneously applicable on like traffic to Alpena, Mich., and other intermediate points on the Detroit & Machinac Railway.

The following extract is from the decision:

Domestic sulphur encounters practically no competition except from iron pyrites, which has been substituted for sulpur in the manufacture of sulphuric acid by a number of plants. Domestic sulphur contains a much greater percentage of pure sulphur, but iron pyrites yields relatively more sulphuric acid. Iron pyrites is worth about $6 per gross ton, f. o. b. Baltimore, while crude sulphur is worth about $22.50 per gross ton. Pyrites is sold on a sulphur unit basis, the price varying with the percentage of sulphur which it contains. The difference in cost, together with cheap ocean rates on pyrites from Spain and other fields of production abroad, account for the substitution of iron pyrites for sulphur. Sulphur must be transported in tight box cars, while pyrites may be handled in open gondola or coal cars. The average loading of sulphur appears to be about 60,000 pounds per car, while pyrites loads to over 80,000 pounds.

NEW MEXICO CHAPTER OF AMERICAN MINING CONGRESS IS FORMED

John M. Sully, of Santa Rita, Elected First Governor—E. L. Wolcott Finds Mining Men of New Mexico Anxious to Cooperate With National Organization—List of Officers

A New Mexico chapter of the American Mining Congress has been formed. John M. Sully, of Santa Rita, was elected governor. This chapter promises to be a very active one.

Through the efforts of E. L. Wolcott, a number of mining men in New Mexico were convinced of the necessity of cooperating with the national organization. He called attention to the fact that practically every industrial activity maintains a national organization. A large number of industries which are insignificant when compared with the mining enterprise spend many times as much money keeping abreast with the national affairs and in making their influence felt in the national capital.

The mine operators in New Mexico apparently are very anxious to embrace this opportunity of cooperating with mining men in other parts of the United States.

The meeting at which the Chapter was organized was well attended by representative mining men. The officers of the New Mexico Chapter are as follows:

Governor—John M. Sully, Santa Rita.

First vice-governor—T. H. O'Brien, Dawson.

Second vice-governor—George H. Utter, Silver City.

Third vice-governor—E. M. Sawyer, Tyrone.

Treasurer—T. L. Lowe, Silver City.

Secretary—Don W. Lusk, Silver City.

Directors—C. T. Brown, Socorro County; T. H. O'Brien, Colfax County; E. D. Tittman, Sierra County; W. C. McDonald, Lincoln County; E. A. Miera, Sandoval County; Gregory Page, McKinley County; L. Bradford Prince, Santa Fe County; John M. Sully, Grant County; A. T. Kirk, Bernalillo County; J. A. Mahoney, Luna County; Evan Fraser-Campbell, Dona Ana County; George A. Kaseman, Bernalillo County; J. L. Lawson, Otero County; J. M. Palmer, San Juan County; Juan M. Vigil, Santa Fe County; Charles A. Spiess, San Miguel County; George H. Utter, Grant County; E. M. Sawyer, Grant County.

Executive Committee—John M. Sully, chairman; C. T. Brown, George H. Utter, E. M. Sawyer and T. H. O'Brien.

CHARTER TO BE ISSUED

The New Mexico Chapter will receive its charter within the next two weeks and in the meantime new members are being solicited. The fifty members necessary to secure a charter were secured the past week through the personal efforts of Mr. Wolcott and George H. Utter, and include the following:

Silver City—M. W. Porterfield, George H. Utter, William H. Newcomb, Charles B. Morrill, George F. Utter, Frank W. Vellacott, F. C. Light, W. S. Cox, Percy Wilson, Terrell & Black, W. A. Welsh, W. B. Walton, C. W. Bayne, E. A. Layne, J. C. Woodward, D H. Tulloch, C. W. McSherry, J. M. Kiner, Jackson Agee, Don W. Lusk, Dean Alexander, J. A. Shipley, T. L. Lowe, Jo E. Sheridan, M. R. Buchanan, A. A. Burdette, William Harris, Theodore W. Carter, E. M. Brumback, F. L. Cox, J. R. Hicks, Isadore Malmuth, E. J. Spitzley, Sam Agee, Dr. Luis de la Garza Cardenas, Martin V. Cox, Leo F. Schiff, Eli Borenstein, C. F. Reihs, F. A. Bush, Howard H. Betts, Raymond R. Ryan, A. S. Goodell, R. H. Boulware, E. B. Venable, C C. Royall, Col. J. W. Carter.

Pinos Altos—James H. Bell, A. R. Davidson.

Bayard—Paul A. Larsh.

Steeple Rock—Harry A. Martin.

A. H. Brooks, H. G. Ferguson and J. Fred Hunter, of the Geological Survey, have returned to Washington after a month spent in the military training camp at Fort Oglethorpe. They are of the opinion that service in these military camps is of the greatest value to men who are called upon to rough it in the mining regions of the country.

W. C. Phalen, of the Geological Survey, spent a portion of last month in Mineral County, Va., inspecting pyrite mines.

Dorset Carter, of McAlester, Okla., who has been spending some time in Washington, where he appeared before the Indian Committee of the House on matters of interest to the Oklahoma operators, has returned to his home.

F. Lynwood Garrison has left for Brazil to be gone several months.

GEOLOGIC EVIDENCE INDICATES THAT VEINS IN ROCHESTER DISTRICT GO DEEP

New Nevada Camp Subject of Special Article by F. C. Schrader of the United States Geological Survey — Deposits Apparently Are of Late Mesozoic Epoch of Mineralization

By F. C. Schrader

The new mining district of Rochester is in the southern end of the Star Peak Range which forms the north half of the Humboldt Range. American Canyon, noted for its large production of placer gold, heads in the eastern part of the district.

The ore deposits are causally related to the dominant dynamic geologic structures. They consist of silver and gold-bearing veins, lodes and associated replacement bodies. They occur in volcanic rocks which are chiefly rhyolites or rhyolitic and of Triassic age. The rocks, having an estimated thickness of 2,000 feet, occur in superimposed flows that dip gently to the east. The veins dip steeply to the west. Some of them have a length of a mile and in some, good ore bodies are opened to the depth of a thousand feet.

The deposits lie in two north-south belts, Nenzel Hill belt on the east and Lincoln Hill belt on the west, which are spaced about two miles apart and are each a mile in width and five miles long. In the Nenzel Hill belt they are chiefly silver-bearing, in the Lincoln Hill belt chiefly gold-bearing.

The Nenzel Hill belt near its middle point contains, Nenzel Hill, an oval silicified knob 3,000 feet long, the seat of the most important deposits of the district. Here the deposits occur chiefly as quartz replacement veins and allied bodies in and associated with fissures, joint planes and shear zones. Some of the veins are 40 feet in width. The ores which average about $20 to the ton contain chiefly silver, but carry also several dollars to the ton in gold, which metal increases in amount with depth.

The ore minerals are chiefly argentite with a little associated proustite, cerargyrite, bromyrite, pyrargyrite, and occasionally scales of native silver and specks of free gold. From the occurrence of bindheimite which is common in the ores it is inferred that silver-bearing sulphantimonites are probably generally present. Pyrite, chalcopyrite, sphalerite and galena are very sparingly present. From the 200-foot level down the ore is mostly sulphide.

At Packard, two miles south of Nenzel Hill, the deposits occur chiefly as massive replacement ore beds in the rhyolite and are associated in origin with a neighboring fault fissure. The main ore bed has a known width of about 100 feet and is opened to the depth of 200 feet. The deposits contain but little quartz, the ore minerals which are chiefly cerargyrite and argentite being contained in the soft schistose rhyolite. Most of the ore produced up to 1916 averaged about $30 to the ton.

In the Lincoln Hill belt the deposits are more distinctly veins of the filled fissure type. The veins are relatively narrow and average only about 5 feet in width. The gangue is chiefly quartz which contains almost exclusively gold ores of high grade, averaging about $140 to the ton, and some that are very rich. The gold is free. The associated minerals are pyrite, arsenopyrite, tourmaline, specularite, argentite, bromyrite, and telluride.

On the north in the head of Spring Valley much of the gold is coarse, which fact suggests that these veins and perhaps similar ones now removed by erosion probably represent an important source of the rich placers mined in Spring Valley and American Canyon.

From the presence of tourmaline and other minerals of deep-seated origin, the replacement character of the deposits, and hydrothermal alteration of the rocks, the Rochester deposits seem to have been formed at relatively high temperatures and at considerable depth. Their origin, accordingly, is referred to magmatic hydrothermal solutions and gases emanating from post-Jurassic granite which as a batholitic mass intrudes the rocks at Wrights Canyon on the north and is believed to extend in depth beneath the Rochester district. The deposits, therefore, seem to belong to the late Mesozoic epoch of metallization and are probably of early Cretaceous age.

From the deep-seated character of the deposits and their close association with the major geologic structures which are shown to have been impressed upon the rocks of the region from the tops of the mountains to below the floors of the deepest valleys the deposits are believed to extend to considerable depth.

C. E. Siebenthal of the United States Geological Survey, has returned from an inspection trip to the lead and zinc properties in eastern Tennessee. He also attended the commencement exercises at the University of Chicago.

CONSOLIDATED KANSAS CITY SMELTING AND REFINING CO. WINS COPPER MATTE CASE

"Regulus of Copper" and "Copper Matte" Held to be Synonymous— Weakness of Statute Allowing Entry of Lead in Copper Matte without Payment of Duty, is Pointed Out

The board of general appraisers has decided that merchandise known and recognized in trade and commerce as copper matte is properly entitled to free entry under the provision in paragraph 461, act of 1913, for "regulus of . . . copper." This conclusion is inevitable inasmuch as the terms "copper matte" and "regulus of copper" are synonymous in meaning and refer to the same article.

The Consolidated Kansas City Smelting & Refining Co. protested against the assessment of duty by the collector of customs at the port of El Paso, a portion of the ruling reads as follows: The merchandise covered by these protests consists of so-called copper matte, which was imported into this country from Mexico, and upon which duty was levied at the rate of three-fourths cent per pound upon the lead contained therein, under the following provision in paragraph 152 of the act of 1913:

> Lead-bearing ores of all kinds containing more than 3 per centum of lead, ¾ cent per pound on the lead contained therein: . . .

The importers contend that the merchandise is entitled to free entry as regulus of copper under the following paragraph of said act:

> 461. Copper ore; regulus of, and black or coarse copper, and copper cement; old copper, fit only for remanufacture, copper scale, clippings from new copper, and copper in plates, bars, ingots, or pigs, not manufactured or specially provided for in this section.

The question here presented has been the subject of a number of rulings by the courts and this board.

In the matter of the protests of the American Metal Co., and Lewisohn Bros., decided by this board in February, 1896, and reported in G. A. 3394 (T. D. 16966), it was held that articles called copper matte were entitled to free entry as regulus of copper; that the term matte was synonymous with regulus, and that the same was not an ore of any kind.

Later, in a case involving a protest filed by the Philadelphia Smelting & Refining Co., this board, in G. A. 4308 (T. D. 20326), followed its former ruling and again held that the article was free as regulus of copper although it was called copper matte. This decision was affirmed on appeal to the Circuit Court o fthe United States in the case of Spencer *vs.* Philadelphia Smelting & Refining Co. (124 Fed., 1002).

Still later, in a case involving the protest of the El Paso Smelting Works, this board again decided (G. A. 5119; T. D. 23656) that the article known as copper matte was free as regulus of copper. Likewise, in Abstract 35013 (T. D. 34279), the board followed its former rulings and sustained the claim that so-called copper matte was free as regulus of copper. The last-mentioned ruling was appealed to the Court of Customs Appeals and there affirmed in the case of United States *vs.* American Smelting & Refining Co. (5 Ct. Cust. Appls., 398; T. D. 34937), the court holding that "the goods involved in this appeal are copper mattes and are entitled to free entry as regulus of copper, inasmuch as the terms 'copper mattes' and 'regulus of copper' have admittedly come to mean the same thing."

All of the issues in the case at bar have been thoroughly tried out and the brief submitted by counsel for the Government is very elaborate, exhaustive, and complete.

The Assistant Attorney General now seeks to have the board find as facts that the article in question is not regulus of copper; that copper matte is not regulus of copper; that the merchandise under consideration is not a copper matte but is more accurately described as leady copper matte; that the word "regulus" is a foreign term and is not used in this country; that by reason of the discovery of a new process for smelting copper mattes containing lead, the lead which was formerly lost in the process of smelting is now reclaimed and saved and that because of this newly discovered process the trade no longer recognizes as copper matte any copper matte which contains lead in large or appreciable quantities; that the mattes here in question, being known as leady copper mattes, are distinguished in trade from regulus or ordinary copper mattes, and, being of a different character from the latter, their classification is not necessarily controlled by the decisions of the court and of this board hereinabove cited.

Moreover, counsel for the Government concedes that the articles are not dutiable under paragraph 152 as copper ore, and that the collectors' classification thereof as such was made in error. He contends, however, that said merchandise is dutiable under either of the following paragraphs of the present tariff act: Paragraph 153 as a form of lead not specially provided for; paragraph 57 as a lead compound not specially provided for; paragraph 81 as a mineral substance; paragraph 154 as a metallic mineral substance in a crude state or a metal unwrought; paragraph 385 as an unenumerated manufactured article, or under paragraph 386 according to the rate applicable to the component material of chief value. But, inasmuch as we have reached a definite conclusion with respect to the tariff classification of said articles, it is unnecessary to here discuss any of the several claims alleged in the protests, save that under paragraph 461.

Although the record made up is very voluminous, we are unable to find anything therein which would warrant us in reaching a conclusion different from that heretofore arrived at in the various rulings of the courts and this board. If a change in the law is desired, it can only be brought about through legislation. It is significant, however, that Congress, up to the present time, with all of the prevailing decisions on copper matte or regulus before it, as well as the ruling (T. D. 9473) made by the Treasury Department nearly 27 years ago, has not seen fit to make dutiable the lead contents of copper regulus, otherwise known as copper matte, nor even to fix a maximum limit concerning the amount of lead which may be allowed free entry when contained in copper regulus or matte. This omission on the part of Congress is particularly noticeable when it is observed that specific provision is made for the zinc contents in lead ores and for the lead contents in zinc ores.

The terms "copper regulus" and "copper matte" have uniformly been held to be synonymous in meaning, and the proof here submitted merely tends to corroborate the correctness of such rulings.

The contention of the Government that the word "regulus" is a foreign term which is not used in the trade and commerce of this country, and therefore is not susceptible of commercial proof, cannot prevail here. Irrespective of the origin of the word, it has become a domestic term by virtue of congressional enactment. If the meaning thereof cannot be ascertained by trade proof or otherwise, then it is perfectly clear that the provision for regulus of copper in paragraph 461 must be held to be null and void on the ground that it is meaningless. There is, however, no justification herein for any such conclusion.

James S. Douglas, of Arizona, is spending some little time in the East

---

E. A. Schubert of Roanoke, Va., was a visitor at the Mining Congress office last month.

RECENT MINING PATENTS

1,187,822. Ore Concentrator, by George B. Eberenz and James I. Brown, of Cripple Creek, Colo.

The invention relates to ore concentrators of that class where the ore is concentrated by gaseous flotation of mineral particles in liquid. They claim to have found that horizontally operating agitating blades do not bring the finely ground ore into thorough contact with the air and frothing agent, and one of the objects of the invention is to improve upon constructions of this character by the provision of agitating blades which move in a vertical plane, and in this connection to provide a spitzkasten so connected with the agitating chamber that the finely ground ore and liquid will be driven into the lower end of the spitzkasten and then sucked back into the agitating tank over the top of the agitating blades whereby more air is beaten into and mixed with the mass in the agitating tank and the whole mass returned again and again to the spitzkasten where the concentrates rise and pass off until the separation of the concentrates from the gangue is complete.

No. 1,187,549. Crushing Machine, by Axel G. P. Rapp, of Chicago, Ill., and is assigned to the Link-Belt Company.

Mr. Rapp claims to have a crushing machine comprising a cylindrical crushing surface, spaced feeding teeth projecting outwardly beyond the crushing surface, with a curved concave being channeled throughout its entire from and above the roll to form a receiving and feeding hopper, the surface of the concave being channeled throughout its entire effective width along lines located in planes perpendicular to the axis of the roll, the axis of the channels being substantially in line with the feeding teeth on the roll, and the side walls of the channels being outwardly and upwardly inclined to meet along ridges between the feeding teeth. This invention particularly relates to that type of machine wherein the material to be reduced is crushed between the concave fixed plate and the rotating roll, where the crushing is accomplished by teeth or knobs on the roll, and the material drawn down into the aperture between the concave and the roll by a series of projecting spikes or teeth.

No. 1,187,481. Carbide Miner's Lamp, by John B. Anton, of Monongahela Borough, Pa. This invention consists in a new and improved carbide miner's lamp. The object in view is the provision of a lamp which will be of simple, compact, durable and inexpensive structure, wherein the gas will be presented to the burner tip at uniform pressure in a cleansed and cooled condition, free from water and mechanical impurities, and wherein the reflector may be readily removed and then replaced, and the burner tube and tip cleansed.

No. 1,187,050. Method of Carbonizing Coal and Obtaining Gas. This invention is by Henry L. Doherty, of New York City. The object of the invention is to provide a method of carbonizing fuel which will permit the carbonization of the fuel in a shaft furnace by heat developed in the shaft furnace itself and at the same time to take off all the products of the carbonizing operation. The invention, briefly stated, comprises the charging of bituminous fuel into a shaft furnace, the establishing of a region of localized and limited combustion in the interior of the fuel mass by introducing a carefully regulated volume of air thereinto whereby a relatively short middle section of the fuel mass in the shaft is raised to a carbonizing temperature, withdrawing the gaseous products of the carbonization through the relatively cold fuel mass in the upper portion of the shaft, whereby the sensible heat of the gases discharging from the carbonizing zone is absorbed by the cold fuel, deluminating a portion of the gas, saturating the same with water vapor, and conducting the vapor-laden deluminated gas to the lower part of the shaft furnace and passing it upward through the mass of coke, filling the same. This coke, of course, discharges from the carbonizing zone at a comparatively high temperature. By properly proportioning the relation between the volume of the vapor and deluminated gas returned to the shaft and the heat held by the coke, filling the part of the same below the carbonizing zone, it is possible to cool the coke discharged down to practically atmospheric temperature.

No. 1,186,874. Vacuum Ore Separator. This invention is by Harry H. Baer, of Orrville, Ohio. The invention relates to improvements in vacuum ore separators, and its objects are: first, to remove by suction the lighter particles of metal producing ores or other metal carrying products, after the ore, rock or other metal carrying products have been reduced by a grinding process to a predetermined degree of fineness; second, to feed the ground product upon an endless conveyer whereby better distribution is brought about by extending the endless conveyer into the inclined rotating cylinder; and third, to withdraw the air from the rotating cylinder while it is being rotated, the inclination of the cylinder being regulated or adjusted with reference to the materials being treated.

No 1,186,451. Miner's Electric Lamp. This invention is by Angelo Toler, of Berwind, Col., and relates to improvements in electric lamps for miners' use and of the class in which the lamp is detachably connected with the miner's cap, while the battery is connected with the waist belt. The object is to provide a lamp of this character so that there will be no possible chance for a spark which might ignite the coal gas or dust within the mine. The lamp proper and its screw stem are mounted in a socket carried by the lamp frame, the filament members of the lamp being respectively electrically connected with contacts concealed within the base of the frame by means of a screw cover which closes the chamber in the base and is locked against removal except by the employment of a special key. Hence, there is no opportunity for an exposed spark resulting from arcing at either contact with which the filament of the lamp is connected. Even the miner himself cannot remove this cover, since he is not supposed to have a key which will unlock it.

No. 1,186,306. Process of Extracting Metals from their Ores. This invention is by William E. Greenawalt, of Denver, Col. It has for its object the attainment of a praticable method of applying electrolysis to the hydrometallurgical process by overcoming entirely the difficulties due to fouling of the electrolyte. To accomplish this the electrolyte is kept separate and distinct from the leaching solution, or lixiviant. In this process the copper is dissolved, preferably, either as the chloride or sulphate. It is then precipitated with hydrogen sulphide, while an equivalent of acid is regenerated. The acid solution is then filtered from the sulphide precipitate and returned to the ore, and this cycle is repeated as often as necessary to get the desired extraction. The precipitate is electrolyzed, preferably to recover the copper and sulphur, so that the sulphur may be again converted into hydrogen sulphide to again pass through another cycle.

No. 1,185,902. Process of Treating Ores. This invention is by Royal S. Handy, of Kellogg, Idaho, and relates to a process for the extraction of metal values from ores, pertaining especially to a process employing an aqueous solution of a suitable chloride.

No. 1,185,817. Process of Treating Metal and Mineral Bearing Materials. This invention is by John L. Malm, of Denver, Col., and is particularly adapted for the treatment of sulphide ores containing iron and other metals such as copper, gold, zinc and silver. In carrying out the invention, the dry ore is fed into a tube or other mill where it is subjected to the action of a halogen gas, preferably chlorine, and a cooling agent in the form of air, whereby gas may act upon the metal contents to such an extent that the chlorine gas is combined with the iron sufficiently to form either the ferrous or ferric chloride dependent upon the metal contents of the ore, this condition being determinend by supplying the proper quantity of chlorine to the iron so that sufficient chlorine for recovering the other metals in the ore may be obtained from the iron chloride when it is broken up. The substantially dry ore passing from the tube is then charged into a suitable roasting furnace, and sufficient heat is applied to cause the sulphur in the ore to produce sufficient heat to ignite the ore. The external heat may then be eliminated, if their is sufficient sulphide contents in the ore to furnish the necessary heat.

No. 1,185,809. This invention is by Nilas D. Levin, of Columbus, Ohio, and is assigned to the Jeffrey Manufacturing Co., of Columbus, Ohio. It relates to improvements in the devices for supporting power drills that are used in forming the apertures in coal or rock for receiving blast charges, particularly in drilling mechanisms of the class wherein each has a main frame adapted to be secured at the top and the bottom to external stationary abutments, such as roof rock and mine floor. Its object is to provide a drilling mechanism with means of support during transportation which will be entirely independent of the fastening devices of the main frame, and to avoid the necessity of separating the elements of the apparatus one from another, beyond the withdrawal of the tool, and enable a single operative to load and unload the combined mechanism, move them from place to place and erect or take down the main frame without separating the tool frame or motor frame therefrom

---

Hearings Assigned

Hearings having a bearing upon the mining industry are under assignment at the Interstate Commerce Commission as follows:

July 3. Toledo Examiner Worthington. I. & S. 834. Coal to Toledo and western stations.

July 6. Philadelphia Examiner McKenna. No. 8833. Lehigh Coal and Navigation *vs* Louisville and Nashville Railroad.

July 10. Washington. Examiner Gerry. I. & S. 800. Coal from Pennsylvania mines. No. 8694. Ford Collieries Co. *vs.* Bessemer & Lake Erie.

July 11. Atlantic City. Examiner Marshall. I. & S. 774. Bituminous coal to central freight association territory.

July 13. Atlantic City. No. 8725. Lake cargo coal rates. No. 8598. Pittsburgh Coal Operators' Association *vs* Pennsylvania Railroad.

Thorne, Neale & Company

Incorporated

601-610 Stephen Girard Building, Philadelphia, Penna.

Temple Collieries—**Harry E.**, L. V.; **Forty Fort**, L. V.; **Mount Lookout**, L. V. or D., L. & W.; **Lackawanna**, D., L. & W. or Erie.

Schuylkill Collieries—**Buck Run**, P. & R.; **New Castle**, P. R. R.

ANTHRACITE

AND

BITUMINOUS

COALS

Agents for

Pardee Bros. & Co.

Lattimer-Lehigh

Bituminous—**Sonman Shaft**, "B" Vein; **Sonman Slope**, "E" Vein.

Sonman Smithing—1½-inch Screened, Low Sulphur, Spongy Coke

SHIPMENTS—RAIL OR WATER

CHAS. E. FERNBERG, *General Sales Agent*

New York Office: 17 Battery Place

Baltimore Boston Chicago Buffalo Mauch Chunk

Cable Address: "THORNEALE"

The Equitable Powder Manufacturing Company

Alton Blasting Powder

Alton High Explosives

Black Diamond Permissibles

FUSE and CAPS

Miscellaneous Supplies

MILLS

Fort Smith, Ark., East Alton and Marion, Ill.

General Offices, East Alton, Ill.

Irvington Smelting and Refining Works

Buyers, Smelters and Refiners of Gold, Silver, Lead, Copper and Platinum Ores, Sweeps and Bullion

Manufacturers of Copper Sulphate

IRVINGTON :: :: :: NEW JERSEY

N. Y. OFFICE—Charles Engelhard
Hudson Terminal Building 30 Church Street

MAKE YOURS A
"Safety-First" Mine
BY USING
DU PONT
Blasting Machines

FIRING loaded bore holes with electrical currents decreases the liability of accidents, increases the efficiency of explosives and reduces the cost of blasting operations.

Simplicity of design, compactness and dependability in operation make Du Pont Blasting Machines practical and popular with blasting crews.

Safeguard life and property by requiring the use of blasting machines for detonation of explosives.

ASK FOR DESCRIPTIVE FOLDER

E. I. du Pont de Nemours & Co.
POWDER MAKERS SINCE 1802
Wilmington, Delaware

DENVER QUARTZ MILLS

AND DENVER STEEL CRUSHERS

have that kind of reliability that constantly and continuously keeps on being reliable.

The Denver Quartz Mill & Crusher Co.
216-17 Colorado Bldg., Denver, Colo., U.S.A.

NEARLY every member of The American Mining Congress utilizes the services of Mining Engineers frequently

THE
MINING CONGRESS
JOURNAL

SAFETY—EFFICIENCY—CONSERVATION

AUGUST, 1916

No. 8

M. R. CAMPBELL
Who discusses the future of coal in this issue

PUBLISHED BY
THE AMERICAN MINING CONGRESS
PUBLICATION OFFICE
MUNSEY BUILDING WASHINGTON, D. C.
$ 2.00 PER YEAR 20 ¢ PER COPY

The best rubber belt we have ever used

These are the words of an Ohio Superintendent using

COMMANDER DRIVE BELT

It is the best Rubber Belt that we have ever used. We have tried out a great many different kinds and none of them come close to equaling the service received from "Commander".

Practically all of our difficult drives have been equipped with it, and on most of them we have tried many kinds of belting, without any comparable degree of service.

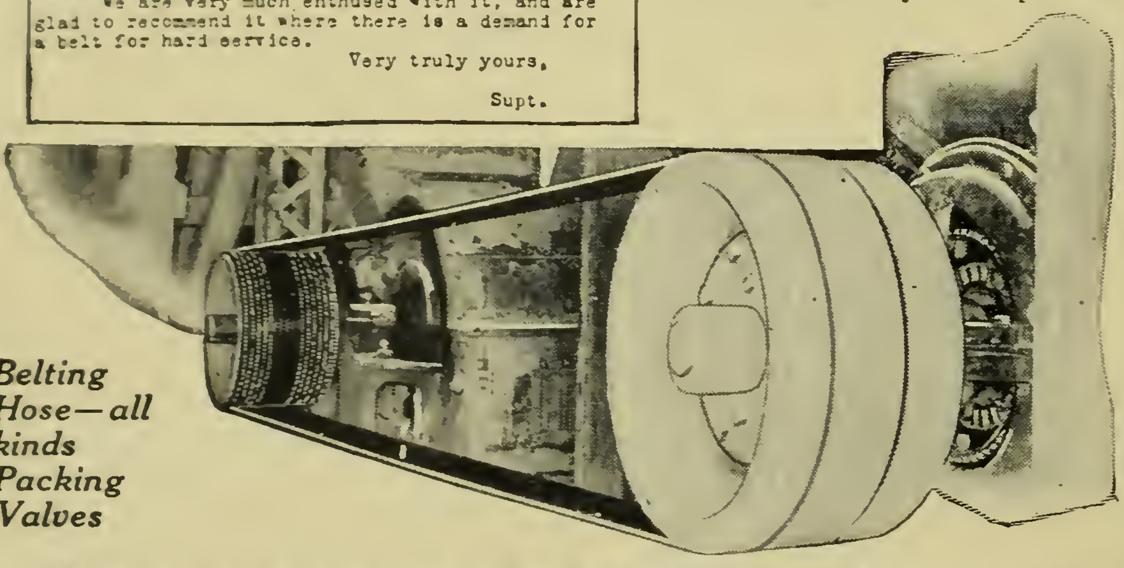
We are very much enthused with it, and are glad to recommend it where there is a demand for a belt for hard service.

Very truly yours,

Supt.

Best for hard service

It takes a "Commander" belt (Commander in deed more than in name) to overcome obstinate drive conditions with a degree of satisfaction termed best by the operator.



There is only one "Commander" a marked leader that commends the admiration of the user.

That accomplishes its hardest task with lower operating costs.
That overcomes objectionable shutdowns.
That creates a new standard of volume in production

and *that* "Commander" is positively the best belt that Goodrich with its 47 years of experience can make.

Specify Commander and test its true worth.

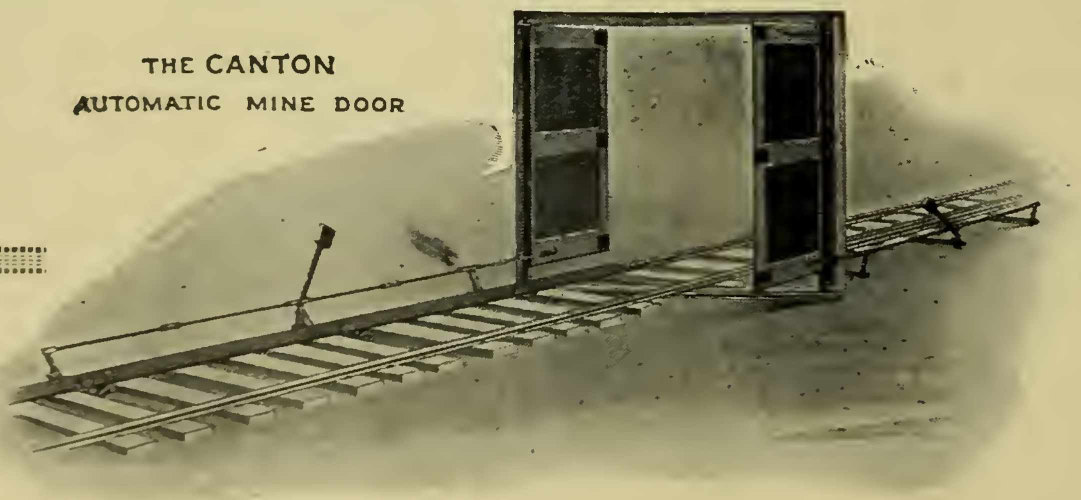
Belting
Hose—all kinds
Packing
Valves

THE B. F. GOODRICH COMPANY Factories: AKRON, OHIO

Makers of the Celebrated Goodrich Automobile Tires—*"Best in the Long Run"* Branches and Distributors in All Districts

---

THE CANTON
AUTOMATIC MINE DOOR



IMPROVED METHODS

Without Additional Expense

If you contend for old time methods, you might try keeping time by employing a boy with a hammer and gong, to strike off the hours as indicated by a sun dial. A trial, however, will convince you that a good clock is cheaper and more reliable. So is the Canton Automatic Mine Door better than a trapper boy. Write for literature.

THE AMERICAN MINE DOOR COMPANY, Canton, Ohio

VOL. 2, NO. 8 WASHINGTON AUGUST, 1916

THE MINING CONGRESS JOURNAL

Official Organ of the American Mining Congress

COPPER TAX LIKELY TO BE ELIMINATED FROM REVENUE BILL

Determined Fight Made in Senate on Provision of Bill—Senators Walsh, Smith, Pittman and Others Denounce Tax Passed by House as Discriminatory and Indefensible—Called "Plain Tyranny"

While it is a very generally held opinion around the Capitol on this date (July 27) that the tax on copper will be eliminated from the revenue bill, there is still considerable uncertainty in regard to it. Senators Stone, Thomas and Hughes, who constitute the subcommittee which is in charge of that portion of the revenue bill which refers to copper, will make no forecast as to the recommendation they will make to the full Finance Committee. The revenue bill opens so many intricate angles of discussion that it is hardly possible that it will be reported to the Senate before August 14.

The presentation of the Revenue bill has resulted in the greatest activity seen at the Capitol during this session of Congress. There are many features of the bill which have brought forth the most vigorous protests, but there is none which seems to be as generally regarded as discriminatory as the tax on copper.

It is stated that some members of the Finance Committee favor a general tax on metals rather than singling out one of them. This plan, however, is not popular and it is far more likely that the copper tax will be eliminated.

In the income tax portion of the revenue bill the following provision is made:

> A reasonable allowance for the exhaustion, wear and tear of property arising out of its use or employment in the business or trade, and in the case of mines, including oil wells or gas wells, a reasonable allowance for depletion of ores and of other natural deposits, not to exceed 5 per centum of the gross value at the mine of the output for the year for which the computation is made; and in the case of timber, a reasonable allowance for stumpage not in excess of the cost of, or capital actually invested in, the timber sold or removed during the year for which the return is made, but with respect to timber purchased prior to March 1, 1913, a reasonable allowance not in excess of the fair cash value of such timber on March 1, 1913: *Provided*, That no deduction shall be allowed for any amount paid out for new buildings, permanent improvements, or betterments, made to increase the value of any property or estate, and no deduction shall be made for any amount of expense of restoring property or making good the exhaustion thereof for which an allowance is or has been made.

The bill as it passed the House makes the following provision for taxing copper:

> Every person smelting copper ore or copper concentrates, refining metallic copper, or alloying copper, shall pay for each taxable year an excise tax equivalent to the following percentage of the gross receipts during each year from the sale or disposition of refined copper or copper alloys and from the sale or disposition of crude or unrefined copper if sold or disposed of for any purpose except for refining or alloying:
>
> One per centum of the amount by which such receipts exceed $25,000 and do not exceed $1,000,000;
>
> Two per centum of the amount by which such receipts exceed $1,000,000 and do not exceed $10,000,000; and
>
> Three per centum of the amount by which such receipts exceed $10,000,000.

Limited hearings were allowed by the subcommittees. Senators Walsh, of Montana, Pittman, of Nevada, and Smith, of Arizona, made personal arguments for the adjustment of the tax. Other Senators and a number of other witnesses also were heard.

Senator Walsh in his argument pointed out that 80 per cent of the copper in the United States is produced by the smelting companies themselves. He called attention to the fact that this was true among the greatest four copper producing companies: The Anaconda Copper Co.; The Kennecott Copper Company (Guggenheim); The Phelps-Dodge Company, and the W. A. Clark companies. Senator Walsh characterized the proposed tax as "obviously and grossly unjust" and said that the enactment of the section of the bill making provision for the tax on copper would be plain tyranny. He contended that copper is no more a munition of war than is cotton, zinc, lead, steel or antimony. He pointed out that every time copper is used in munitions it is combined with a considerable portion of zinc.

The sub-committee was very much surprised when Senator Walsh produced figures showing that the exports of raw copper are not as great at present as before the war, and that during the greater portion of the time since the beginning of the war copper exports were very much below normal. The central powers took 170,000 tons a year before the war and despite the somewhat heavier purchases by the allied countries they are not equal to the peace demand from Germany and Austria.

Senator Walsh called attention to the fact that many other articles have increased in price in greater proportion since the war began than has copper. He supported this statement with figures obtained from the government and other absolutely authoritative sources. He also embodied in his statement the recent mid-year statement on metal production given out by the Geological Survey. He made a part of his presentation of the case the arguments on which is based the expert conclusion that copper would be selling for twenty to twenty-five cents per pound if there had been no European war.

It is the conclusion among Senators that the Ways and Means Committee of the House accepted the proposal to attack copper at the last moment as there are various indications that it was thrown into the bill at the last moment.

Senator Walsh went into details and discussed the method of mining and treating copper.

Senator Thomas propounded a number of very illuminating questions.

SENATOR SMITH'S STATEMENT

Senator Marcus A. Smith, of Arizona, made the following statement to the sub-committee:

The very illuminating argument of the Senator from Montana leaves little for me or any one to say in favor of striking this whole copper schedule from this bill. How it ever got into the bill is beyond my comprehension, unless the author of the strange proposition felt that inasmuch as the copper miners and refiners were enjoying for once great prosperity, and therefore should contribute large sums through taxation to the general welfare, and particularly because the very limited area in which that metal is produced, furnished so small a number of Senators and Congressmen that no difficulty would be encountered in imposing the exaction. Be that as it may; the tax attempted in this schedule is monstrous and utterly indefensible. It outrages every sense of justice and every principle of equity in any mind acquainted with the facts about the case. There is no more reason to tax copper as munitions of war than there is to tax zinc, lead, steel, pig iron or cotton, which is to some extent used in explosives, and declared conditional contraband of war. Nay, there is less reason to tax copper than there is to tax pig iron as war munitions.

Senator Thomas. Do you not think as a fundamental objection we might concede the falacy of every other one urged, still that would remain an insurperable objection to the imposition of a tax on copper?

Senator Smith, of Arizona. Unquestionably. That consideration alone should defeat this proposed tax. It resolves itself at last to a question of fairness and legislative decency. The people producing copper justly feel that it is a bare faced imposition on them and because, perhaps, they could not—as I have stated—by reason of their limited representation in Congress, successfully defend themselves. On this phase let me say that we will make up in zeal and earnestness what we lack in numbers, in resistance of this tax. It is violative of that provision of the Constitution requiring uniformity in taxation. If war munitions are to be taxed and the spirit of uniformity preserved, why are iron and lead and zinc absent from this schedule?

Senator Thomas. Suppose we should enact the law as it came over from the House, with that discrimination so apparent, do you think it would be enforced in the courts?

Senator Smith, of Arizona. Considering certain recent decisions of the courts I am not willing that this matter should ever get that far.

Senator Thomas. Well, as an abstract proposition of law?

Senator Smith, of Arizona. As an abstract proposition I have no doubt of the illegality of this tax on copper. Out of abundant caution I am led to fear that the court might hold that Congress had power to impose the tax on this product and omit the other articles, by holding that the tax was imposed on all within a certain class and was as to that class uniform in its operation and therefore not obnoxious to that provision of the Constitution requiring uniformity.

Senator Thomas. On the face of this law it is an obvious fact that occurs to every man—and your attention is directed to the face of the bill—that there are certain metals singled out with no reason that rests itself in the mind at once for the purpose of levying upon them an enormous tax and every reason to be assigned for it is equally applicable to a dozen other elements all around it. Now the fundamental principle of taxation, as Senator Walsh has stated to the committee, is uniformity, and for the very reason that they are empowered to levy a tax on commerce, I believe the courts in their capacity would, by means of the power of Congress, use it. It would be in a way like levying a tax upon you and exempting every other man in this room.

Senator Smith, of Arizona. I am sure most lawyers will feel that such obvious discrimination against one metal used to a relatively small extent in the manufacture of war munitions, violates the law of uniformity. The only case directly in point that I can recall, arose in the cotton tax case just after the war. In the lower court an injunction was sought restraining the

(Continued on page 374)

MUCH OF COUNTRY'S HIGH GRADE COAL MAY BE EXHAUSTED WITHIN 50 YEARS

M. R. Campbell, of United States Geological Survey, One of Nation's Most Competent Authorities on Coal, Makes Striking Observations with Regard to Future of Coal Production—Coal Reserves Estimated

Some striking facts with regard to coal are brought out in the following statement by M. R. Campbell, of the U. S. Geological Survey:

"In undertaking to make an estimate of the original tonnage of coal in the ground, certain assumptions must be made as a foundation; and the results attained will depend largely upon these assumptions. The three principal assumptions are: (1) minimum thickness of bed of the different ranks and grades of coal that can be mined; (2) maximum depth to which mining may be carried in the different ranks of coal; and (3) maximum percentage of ash that may be permitted in the various ranks of coal. As probably no two persons who have attempted to make estimates have made the same basic assumptions, so no two estimates agree as to the tonnage involved. This point is very important; and is one that is usually lost sight of by the casual reader, who doubtless wonders why it is that experts disagree so widely in their estimates; whereas, if he had analyzed the results a little more closely, he might have found that the results were practically in accord.

ENGINEERING PRACTICE

"Most engineers employed by private corporations base their estimates on the present practice of mining and preparation for the market, for these are the conditions that the mining company must face; and it is manifest that it will not consider coal as minable at a depth of 4,000 feet, while plenty of the same kind of coal is available at a depth not exceeding 1,000 feet. Similarly, it will not consider as minable a coal bed 20 inches thick, while there are other beds of the same kind of coal of much greater thickness still available. Also to the operator of the present time 15 per cent of ash in a coal may prevent its sale, and therefore its mining may be impracticable; whereas, if a washery were installed and plenty of water were available, 15 per cent of ash might be no bar to the mining and marketing of the coal. Most of the estimates so far made have been based on present mining conditions and practices, and hence they do not necessarily represent the tonnage that may be regarded as available ten or even five years hence.

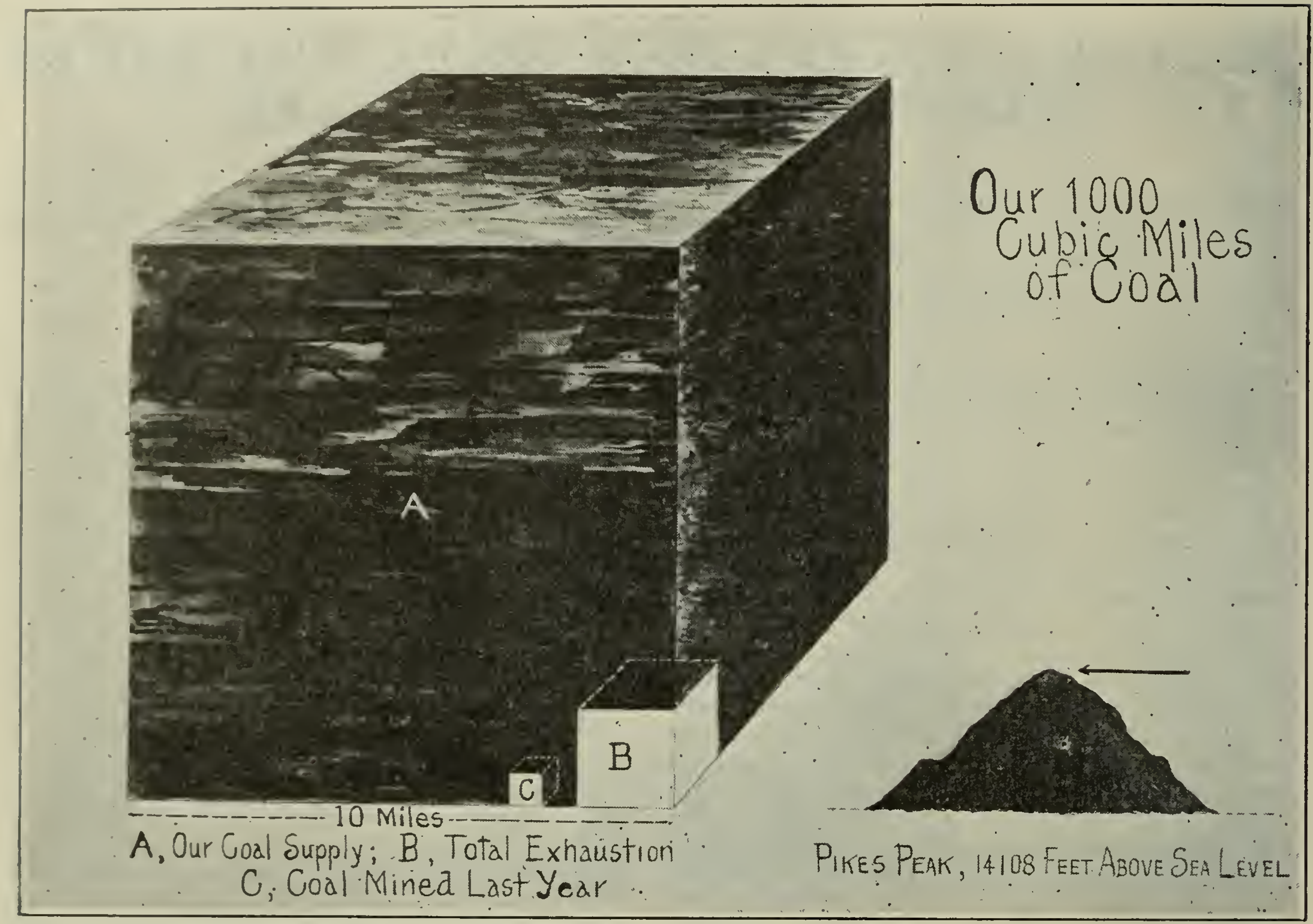
LOOK TO FUTURE

"In attempting to make estimates of the original coal tonnage of the fields of the United States, the Geological Survey decided that it would be not only a waste of time and money to attempt to make estimates based on present mining practice, for such an estimate would be misleading in that it would not represent the total quantity of coal that undoubtedly would be made available in the future. With this point in mind, it was decided to attempt to estimate the total quantity of coal that ever would be mined in the United States, looking ahead forty, fifty or perhaps even 100 years. Of course, it is not contended that any one living can say positively what will be done 100 years hence, but an attempt was made to make such a forecast into the future. In doing so, the present mining practice throughout the world was considered; and the assumptions regarding maximum depth, minimum thickness, and maximum impurity were based upon present practice, but generally exceeded because it is almost certain that future operations will go far beyond the present practice, even where today the methods are far better than those generally prevailing twenty or even ten years ago.

"As the deepest coal mines in the world (in Belgium) go to a depth of approximately 4,000 feet, and as shafts for copper and other metals have been sunk to a depth of over 5,000 feet, it was thought that coal mining in the future might be carried to a depth of 6,000 feet; but in order to meet various requirements two limits were set, one at a depth of 3,000 feet for easily minable coal, and the other at a depth of 6,000 feet, which represent what is now considered as the ultimate limit of coal-mining operations. Similarly the minimum thickness of coal bed mined in the United States is about 15 inches, therefore 14 inches was taken as the minimum of high rank coals for estimating the original tonnage in the various fields. The minimum thickness varies according to the rank of the coal, being approximately 2 feet in subbituminous coal and 3 feet in lignite. The maximum percentage of ash permissible in a coal is more difficult to determine, on account of the variability of the factors involved in the question of cleaning such coal for the market. Thirty per cent has been regarded as the limit, with a question as to whether or not it had better be placed at 25 per cent.

SOME DATA INACCURATE

"With the basic factors of the process determined, the actual application of the principle of estimation is an engineering problem, which depends upon the data collected by the geologist and his mapping of the coal fields. In many of


Our 1000 Cubic Miles of Coal
A
B
C
10 Miles
A, Our Coal Supply; B, Total Exhaustion
C, Coal Mined Last Year
Pikes Peak, 14108 Feet Above Sea Level

the fields these data are fairly sufficient, and a reasonably accurate estimate has been made; but in other fields the data are confessedly inadequate, and the estimate is correspondingly unsatisfactory.

DISTRIBUTION OF COAL

"A statistic shows clearly certain features regarding the distribution and amount of coal in the fields of the United States that are of the greatest interest. It shows first that the great bulk of the coal in this country is of low rank bituminous, lignite, and sub-bituminous, named in the order of their abundance; and that the high-rank coals are relatively scarce. This is an important point in conservation; as it means that our best coal will be the first to be exhausted, and that such exhaustion may occur in the not very distant future. It is also noticeable that the best steaming coal, the semi-bituminous, is practically limited to the two eastern provinces, and that the exhaustion of this coal will be a greater calamity to the country than the loss of all the anthracite, for this kind of coal has a greater efficiency and is adapted to more diverse uses than is anthracite. Most people think of the eastern part of the United States as the greatest repository of coal in the country, and therefore they may be surprised to find that there are two areas in the West that contain a greater quantity. The greatest quantity of coal that is contained in any single area of continuous coal-bearing rocks is 1,202,032,000,000 tons in the Fort Union region of Montana, Wyoming, and the Dakotas; the second is 665,660,600,000 tons in the Green River region of Wyoming; and the third is 550,898,800,000 tons in the Appalachian region of the East.

ORIGIN OF PRODUCTION

"When the production of the mines is compared with the original tonnage it is seen that the great bulk of our coal is not necessarily coming from the areas which contain the greatest quantity, but from the areas which contain the best coal. This discrepancy is more startling when the production of the individual States is compared with their original tonnages.

"Although the relative size of the contents of the coal fields may be a matter of some surprise, the really staggering fact is the immense, really inconceivable total tonnage of the coal fields. If all of the unmined coal within 3,000 feet of the surface, or 3,538,554,000,000 short tons, could be placed in one great cubical pile as solid as it now lies in the ground, it would make a pile 18 miles long, 18 miles wide, and 18 miles high. Similarly, if all of the coal that has been mined in the United States, plus about 50 per cent for waste, or 15,083,100,000 short tons, were similarly piled, it would make a cube 1,540 feet long, 1,540 feet wide, and 1,540 feet high, or in other words about 4 per cent of the original amount has been mined or wasted in mining.

"There has been considerable speculation regarding the length of time the coal supplies would last, but here again there are so many unknown factors that any estimate partakes of the nature of a guess. In attempting, therefore, to calculate how long the available coal will last it is manifestly incorrect to base it on the present rate, or rather the rate for the last decade, for the rate in the future will continue to increase for at least a long time to come. If we assume that the rate of consumption will remain the same as it was in 1913, then after allowance has been made for unpreventable waste in mining and marketing there will be enough coal to last 4,000 years; but, of course, such an estimate is absurd, for the rate of 1913 will not be held in the future probably for a single year.

MAY LAST ONLY 100 YEARS

"If consumption be prolonged at its rapidly increasing rate, and this acceleration continues until the complete exhaustion of the coal, the supply would probably not last 100 years. The true life of our coal fields probably lies between these two extremes, with the probability that it will be nearer 100 years than 4,000 years.

"In 1908 E. W. Parker attempted to extend the curve of production to what he conceived might be the possible maximum that would ever be reached in this country. The past and the estimated future production was grouped by decades beginning with 1835 and extending to the year 2055, when, according to his calculations, the maximum production of 23,000,000,000 short tons would be reached. As the quantity of coal mined in the decade ending with 1914 was 4,779,820,431 short tons, the maximum according to Parker's figures would be roughly five times the present production. After the maximum had been reached the production, owing to increased cost of mine haulage, of hoisting from deeper shafts, and of working thinner beds, would gradually decrease, but in all probability the decrease would be much less rapid than the increase up to the maximum. According to the present estimates there is enough coal in the ground for production to continue at this assumed maximum rate for more than ten decades or 100 years.

EXCEEDING ESTIMATE ALREADY

"The production figures available since 1908 show that Parker's curve is too flat, for his estimate of the production in the decade ending in 1915 of 4,528,000,000 tons is already exceeded in the production of the decade ending with 1914, which is 4,779,820,431 tons. Thus it seems probable that his estimated maximum production is too small, or that the maximum will be reached before the year 2055. The former is the more probable hypothesis and therefore the maximum production will probably be greater than 23,000,000,000 tons in a decade.

"Although the ultimate exhaustion of the coal reserves of the United States appears, by every legitimate hypothesis to be so far in the future that it need concern this generation but slightly, it must be remembered that the bulk of the coal being mined today is the best in the country and that before long, perhaps within fifty years much of the high-rank coal will be exhausted. Although there will still remain a vast quantity of poorer fuel, it behooves this generation to guard carefully its stores of high-rank coal.

"According to the latest estimates the coal reserves of the world by continents, expressed in short tons are as follows:

Americas	5,627,823,500,000
Asia	1,410,487,600,000
Europe	864,412,600,000
Oceania	187,842,900,000
Africa	63,755,900,000
	8,154,322,500,000

"Of the amount contained in the Americas, the United States claims 4,205,154,000,000 tons, or 51 per cent of the total coal in the world. Listed according to coal reserves, expressed in short tons, the principal coal-producing countries of the world stand as follows:

United States including Alaska	4,231,352,000,000
Canada	1,360,535,000,000
China	1,097,436,000,000
Germany	466,665,000,000
Great Britain and Ireland	208,922,000,000
Siberia	191,667,000,000
Australia	182,510,000,000
India	37,083,000,000
Russia in Europe	66,255,000,000
Union of South Africa	61,949,000,000
Austria	59,387,000,000
Colombia	29,762,000,000
Indo-China	22,048,000,000
France	19,382,000,000
Other countries	69,369,500,000
	8,154,322,500,000

Safety Lamps Approved

The Bureau of Mines has approved for safety and for practicability and efficiency in general service two additional portable electric mine lamps:

The "Wico" lamp (Approval No. 14) by the Witherbee Igniter Co., of Springfield, Mass. The only bulbs that have been approved for use with this lamp are the Symbol BM-14 bulbs made by the Edison Lamp Works of the General Electric Co., at Harrison, N. J.

The Concordia lamp (Approval No. 15), made by the Concordia Safety Lamp Co., of Pittsburgh, Pa. The only bulbs that have been approved for use with this lamp are the Symbol BM-15 bulbs made by the National Lamps Works of the General Electric Co., at Cleveland, Ohio.

Each of these lamps will be identified by a brass approval plate approximately 3 inches by 2¼ inches in size which is riveted to the battery casing. Upon this plate are engraved the seal of the Bureau of Mines and the statement and number of the approval. Lamps that do not bear an approval plate are not to be considered as approved lamps. This statement also applies to explosion proof coal-cutting equipments. All employes of the Bureau have been urged to emphasize the indispensability of the approval plate, which is the Bureau's formal certificate of approval.

DIVIDES IRON-DEPOSITING BACTERIA IN THREE GROUPS

"The enormous importance of bacteria in all that pertains to the nutrition and well-being of animals and of the higher plants is today a matter of wide recognition, even by those whose knowledge of the part played by these minute and wonderful organisms is far from exact. The investigations of Pasteur opened our eyes to their deadly power in disease and their enormous efficiency in processes of fermentation and decay. Realization of the influence of bacteria in affecting the character and fertility of soils, in bringing about rock decay and in producing other geological results has come more slowly." These are observations of F. L Ransome, of the Geological Survey. In addition Mr. Ransome says:

"It has been known since 1836 that certain bacteria have the power of withdrawing iron from solution and causing its precipitation as ferric hydroxide or ferric sulphide, as the case may be. The geological applications of this discovery, while foreseen by some to be far-reaching, have been rather slowly made and it is safe to say that many geologists have paid little attention to the possible extent of bacterial action in the deposition of iron ores. Lately, in connection with the studies in coastal plain geology now in progress, under the direction of T. W. Vaughan, the part played by bacteria in the deposition of limestones has been specially investigated and found to be important. Similarly when Mr. Harder, who has devoted particular attention for some years to the occurrence of iron ores, was detailed to study the Cuyuna Range, Minnesota, he found an opportunity in the laboratories of the University of Wisconsin to pursue investigations on the iron-depositing bacteria.

"Opinions have differed as to the mode whereby the bacteria withdraw iron from solution. Some investigators have maintained that the deposition of iron hydroxide is one of the vital processes of the organism and as such is affected directly by the action of the living cell; others, that the precipitation is purely chemical and is incidental to rather than essential to bacterial life; and still others, that the accumulation is mechanical, particles of iron hydroxide present in the water being caught and held by mucilaginous parts of the bacteria.

"Mr. Harder has found that in addition to the iron-depositing bacteria proper, chiefly the higher or thread bacteria, probably many of the common soil and water bacteria are active in the precipitation of ferric hydroxide or basic ferric salts from solutions containing iron salts of organic acids. This result is believed to be new. Such bacteria apparently utilize some constituent of the salt other than iron, the iron hydroxide being left as a waste product.

"Mr. Harder believes that, according to present knowledge, there are three principal groups of iron-depositing bacteria; (1) those which precipitate ferric hydroxide from solutions of ferrous bicarbonate, using the carbon dioxide set free and the available energy of the reaction for their life processes; (2) those which do not require ferrous bicarbonate for their vital processes but which cause the deposition of ferric hydroxide when either inorganic or organic salts are present; and (3) those which attack iron salts of organic acids, using the organic acid radical as food and leaving ferric hydroxide, or basic ferric salts that gradually change to ferric hydroxide."

BENEFIT OF FIRST-AID TRAINING SHOWN QUICKLY

The profit of first-aid knowledge was shown strikingly in an incident described by G. T. Powell, one of the Bureau of Mines' foreman miners. Mr. Powell tells of the incident as follows:

"While training the miners from the Crescent mine at Evansville, Ind., there were a large number of spectators, two of whom were workmen at a foundry close by. A few days later one of the workmen at the foundry received a compound fracture at about the middle of his right forearm, while at work, and had received quite a large laceration. The men started to cover the wound with dirty material as they usually did, but one of the fellows who was looking on, stopped them and applied a tourniquet made from his handkerchief and splinted the forearm as he saw us do while training. The man was taken to the hospital, and when the doctor saw the dressing, he made the following remark: 'Well, I see you have some first-aid man at your place, and he certainly has put on a dandy dressing.' The foreman said they had not put anything on the wound, as the man who put the boards on would not let him. The doctor said that whoever put the splints on knew his job, especially in not putting any dirty cloth on the wound, and that he had done the proper thing not to put on any dirty material when he did not have sterile material. Receiving this compliment on the first dressing that he applied, the foundryman is considered quite a hero, especially since all the training he had was in watching the miners' practice. The men at the foundry have been after me ever since to give them the same training that I give the miners."

HUNT FOR OIL AND GAS IN TETON COUNTY, MONTANA

The Geological Survey is making an examination of the extension into Teton County, Mont., of a belt of cretaceous and tertiary rocks which are known to contain oil and gas north of the Canadian boundary.

The examination is to be made with the object of ascertaining the possibility of the occurrence of oil and gas in these same rocks south of the border. Eugene Stebinger is the geologist in immediate charge of the investigation.

TUCSON, ARIZONA, AND FAIRBANKS, ALASKA, GET MINING EXPERIMENT STATIONS

Director Manning, of Bureau of Mines, Hurries West to Investigate Best Site for Third Station—Karl Kithil to Have Charge at Tucson, and J. A. Davis at Fairbanks

Secretary of the Interior Lane on July 22 announced the location of two of the three mining experiment stations and the three mine-safety stations provided for in the act passed last year by Congress and appropriated for at the present session. The first of the experiment stations is to be at Fairbanks, Alaska; the second at Tucson, Ariz.; and the third, not yet definitely announced, in the Pacific Northwest. The exact location of the last-named station is being held in abeyance pending personal investigation of the needs of that section soon to be made by Director Van H. Manning of the Bureau of Mines at the request of Secretary Lane. The safety stations as decided upon will be at Butte, Mont.; Reno, Nev.; and Raton, N. Mex. The sum of $25,000 is appropriated for each of the mining experiment stations and $101,500 for the three safety stations.

Karl Kithil will have charge of the Tucson station and J. A. Davis of the Fairbanks station.

The act authorizes the Secretary of the Interior to establish in the several important mining regions of the United States ten mining experiment stations and seven mine-safety stations in addition to those already established, but provides that not more than three of the experiment stations and the same number of safety stations shall be established in one year. The purpose of all the stations according to the law is to make investigations with a view toward improving conditions in the mining, quarrying, metallurgical and other mineral industries, safeguarding life among employes, preventing unnecessary waste of resources, and otherwise contributing to the advancement of these industries.

Each of the mine-safety stations is to be equipped with an all-steel mine rescue car which will respond to disaster calls within its prescribed territory. Congress has appropriated $53,000 for the purchase of the three cars and the contracts are about to be let by the Bureau of Mines. These cars will be of special design and will represent the most modern thought in rescue work. They will be manned by expert crews of life savers, who, when they are not employed at a mine disaster, will go to the different mining camps and train the miners in rescue work and first aid to the injured.

KARL KITHIL

Director of Experiment Station to be Established at Tucson, Ariz.

"The establishment of the metallurgical experiment stations and the safety stations is one of the most important constructive steps that has been taken by Congress in the upbuilding of our mineral industry," said Secretary Lane in commenting upon the announcement of the location of the stations. "It is a most deserved recognition of an industry which now has a yearly output of probably two and a half billion dollars and which is next to agriculture in its importance to the welfare of the country.

"The experiment stations come to the great West at a time when they are peculiarly needed. The great impetus which has been given the industry through the European war and the coincident development of the so-called oil flotation process in the utilization of the lower grade ores have emphasized the necessity for such research aid as only the Federal Government can give. With the development of metallurgical processes, many of which are now under way, I expect in the near future to see a much greater industry, enjoying greater prosperity and employing more men, with the utilization of the low grade mineral deposits to their highest extent. Already there are signs that this is coming. Old mines are being reclaimed, abandoned dumps which contained supposed worthless material are being worked over, and many prospects that heretofore were not considered workable are being turned into substantial mines.

"And with the three mine-safety stations, we are not forgetting the men who toil beneath the ground. Their safety is an important part of the work of the Bureau of Mines.

"There has been a great deal of earnest rivalry between different localities for these first experiment and safety stations and it has been difficult to make the selections. I can only say that the matter has been given most careful thought in all its bearings and that we have done what we thought was for the best. In the future some of the other localities will be given their opportunity."

SAFETY-FIRST SLOGAN FOUND WONDERFULLY SUCCESSFUL

A special investigator of the Department of Labor of the New York Industrial Commission has been at work in some of the big plants where large numbers of men are employed and he reports that the "safety first" slogan has been wonderfully successful in reducing the number of deaths and accidents at these places, says an editorial in an eastern paper. To many persons these magic words are meaningless or are accepted as a good-natured jest, but this official finds that injuries at the plants under consideration show a reduction ranging from 34 to 92 per cent of the rates prevalent before the inauguration of the movement. Fatal accidents at the works of the Lackawanna Steel Company in 1915 were 90 per cent below those in 1914. The United States Steel Company and the International Harvester Company report results which are almost as gratifying.

The chief value of this movement lies in the fact that it has taught men to stop and think. Heretofore many men and women employed in large industrial establishments have gone along with a delightful sense of irresponsibility. But now they are being gradually taught to take care of themselves, and the results are shown in the figures presented by the New York investigator. The general public has had no conception of the appallingly large number of accidents in industrial establishments. It has been supposed in a hazy sort of way that it is dangerous work in coal mines and on railroads, but there has been no adequate conception of the lives that have been lost and the number of persons that have been maimed in other lines of human endeavor. But the campaign of education that has followed the cry of "safety first" has had wonderfully effective results. It proves the difference between systematic effort and luck and chance.

The average employer is a pretty decent sort of person. It is a mistake to suppose that he is indifferent to these unfortunte accidents. Aside from the humane feature of the business it is against his interests to have his employes killed or maimed, and as a consequence the heads of these concerns have welcomed the movement for cooperation in guarding against avoidable accidents. In many of these concerns prizes are offered to the men who make the best suggestions for preventing accidents and the responses have been most gratifying. It has had the effect of improving the relations between employes and employers by demonstrating that their interests are identical. It has engendered a feeling of mutual regard which has helped one as much as the other. Altogether it has been a move in the right direction.

SAFETY-FIRST TOUR TO END SOON—IDEA PROVES POPULAR

One of the most popular things which has been done by the Bureau of Mines is the Safety-First Train. This train carries exhibits showing the activities of the Government in the saving of life and property.

While the exhibits are contributed by twenty-five government bureaus, the idea originated in the Bureau of Mines, and it is that Bureau which is engaged in work looking to the conservation of life and property on a larger scale than any other division of the government departments.

The safety-first train, which consists of twelve extra-length steel cars, was furnished by the B. & O. Railroad. It was through the cooperation of that railroad that it was possible for several hundred thousands of persons to see the exhibits. The Government has made no appropriation to cover the expense and equipment of the train, or the cost of its transportation.

Director Manning has been embarrassed by the large number of requests which have been made for the train, as he cannot direct its itinerary. Practically every congressional district in the United States is anxious that the safety-first train visit it. Congressmen and Senators have been very active in their efforts to secure a trip through their portions of the country.

Since the train can only go over such lines as may make arrangement with the company owning the equipment, it will be impossible to cover the entire country as desired. The success of the train, however, lead to further effort along this line, which will enable more people to view the safety-first exhibits, although it is expected that the tour will end soon as the railroad company has given notice that it cannot afford to do without the equipment any longer.

GOVERNMENT EXPERTS WELL KNOWN TO MINING MEN

Photo. by Harris & Ewing

ADOLPH KNOPF
Geologist

Adolph Knopf was born in San Francisco, 1882. His early education was obtained in the public schools of that city. Following the completion of his high school course he attended the University of California, and was graduated from that institution in 1904 with a degree of B.S. He took a post-graduate course and earned a degree of Ph.D. which was given him in 1909.

In 1905 Mr. Knopf began temporary work with the U. S. Geological Survey. The summer of that year was spent in Alaska. The following year he was put upon the permanent roll and did Alaskan work exclusively.

While in Alaska his principal studies were confined to tin, gold and copper deposits. He is the author of a report on the tin deposits of Alaska, as well as many articles on gold and copper.

During 1912 and the years since then, Mr. Knopf has been working upon metalliferous deposits in Montana, Nevada and California. He is author of a report on the platinum deposits in the Boss Mine, Good Springs, Nev. He has a report on the Yerington district of Nevada in preparation.

ALASKA-JUNEAU SUPERINTENDENT PRAISES FIRST-AID TRAINING

The amount of good that is being done by the Bureau of Mines in training miners in first aid and rescue work cannot be fully known. The trained men, as a rule, go about their daily tasks in the usual way, and whenever occasion arises where they have to give succor they respond willingly and lives are saved. It is almost an ordinary event in the life of a first-aid man and he does not think it is necessary to make any report which will reach the public. Only occasionally does direct testimony come of the lives that are being saved through knowledge gained in first-aid and mine-rescue training.

At Juneau, Alaska, recently, the mining camp of the Alaska-Juneau Gold Mining Co. was startled by the disappearance of a four-year-old boy, Francis La Rochelle. J. H. Richards, superintendent of the mine, gathered a party together and searched the country. The boy was found unconscious, was given first-aid treatment, and is on the way to recovery.

In writing of the case to S. S. Smith, federal mine inspector for Alaska, Mr. Richards said:

"I believe that first aid was entirely and directly responsible for the saving of Francis La Rochelle's life. Immediately after the boy was found in an unconscious and nearly frozen condition, his clothes were cut off and replaced with dry, warm ones, taken from the backs of those in the searching party. An effort was at once made to start the circulation, by rubbing and chafing the boy's limbs and body. As soon as possible he was taken to the hospital, but the rubbing treatment was continued while en route there on the train. The prompt treatment to restore the boy's circulation and the application of warm clothes really saved the boy's life, for his vitality was extremely low when we found him.

"I believe Frank White was the only one in the party who has had the benefit of the instruction given in first-aid work by yourself and previous to your coming to Juneau, by Guy Johnson, of Treadwell, but the other men in the party lent a ready hand. We appreciate very much what you and Mr. Johnson have done in the way of teaching the men this work. I feel sure that it will be very beneficial to us in connection with our work, as accidents occasionally occur, and by having our men trained, they will be ready to help any unfortunate sufferer."

DEMAND FOR SULPHUR CONTINUES DESPITE HIGH PRICE

The demand for sulphur continues to increase. Prices are steady at record figures as compared with $22.50 per ton, which is the normal price of sulphur.

The extraordinary demand for this mineral is due to the increasing call for sulphuric acid. While a considerable portion of this acid is being used for the manufacture of explosives, the demand is increasing from the manufacturers of paper and from other commercial sources.

USE OF OIL SHALES IN NEAR FUTURE IS FORESEEN

Against the time when the people of the United States will find it advantageous to begin to utilize the richer part of oil shales for the distillation of their hydrocarbons, the U. S. Geological Survey has resumed its investigations of the deposits of the shales in northeastern Utah.

Circumstances during the past year lead more than ever to the conclusion that oil shales may be used economically in the very near future. The areas containing shales are being mapped. The thickness of the richer beds is being measured at many points. Tests are made in the field by dry distillation to determine roughly, the amount of oil contained in the different beds.

It is proposed to extend these tests to other of the more richly carboniferous beds which have been observed or reported to the Survey.

An advance statement giving the more important results of the previous investigations of these shales has been published quite widely during the past few weeks.

A great deal more data are now available following the detailed results of the distillations made by different processes. Interesting facts have developed as to the gasoline, ammonia, tar and other products.

Working in Big Horn Basin

Investigation of the oil and gas structure in the northern part of the Big Horn Basin, Wyoming, is being conducted by C. J. Hares and a party of geologists.

"Who Am I?"

"I am more powerful than the combined armies of the world.

"I have destroyed more men than all the wars of the world.

"I am more deadly than bullets, and I have wrecked more homes than the mightiest of seige guns.

"I spare no one and I find victims among the rich and the poor alike, the young and the old, the strong and the weak, widows and orphans know me.

"I loom up in such proportions that I cast my shadow over every field of labor, from the turning of a grindstone to the moving of a railroad train.

"I massacre thousands upon thousands of wage-earners in a year.

"I am relentless. I am everywhere; in the home, on the streets, in the factory, at railroad crossings, in the mine, and on the sea.

"I bring sickness, degradation and death, yet few seek to avoid me.

"I destroy, crush or maim, yet I give nothing.

"I AM CARELESSNESS."

GEOLOGIST SAVES HISTORIC PILLAR FROM DISINTEGRATION

That the Geological Survey is of aid to others besides the miners of the country is shown by the following letter from Director Smith to the Secretary of the Treasury:

Edson S. Bastin, whom I assigned to make an examination of the pillar in the south portico of the Treasury Building, which is undergoing distintegration, has made an examination and reports as follows:

The damage consists in the disintegration of the granite at several points. The immediate cause of the disintegration appears to be free sulphuric acid. The disintegration is confined to the immediate vicinity of cement layers between different blocks of granite and is not caused by any defect in the granite itself. The primary cause of the trouble appears to have been the application of acid in cleaning the granite. This acid has worked into the cement between the granite blocks at a few places where this cement was somewhat fractured. The cement proves to be a gypsum cement containing a considerable amount of iron, and the free acid used in cleaning the stone, has attacked this cement, developing iron sulphate and alum; the iron sulphate on contact with the air yields free sulphuric acid. The process therefore is a more or less continuous one. The small amount of the acid which worked in during the cleaning process sufficed to start the process of acid generation from the cement.

As a remedy for the difficulty, I suggest that the decayed portions of the granite be scraped away, that the disintegrated portions of the cement also be scraped out so far as possible, and that the affected parts be then thoroughly washed with a solution of chemically pure sodium bicarbonate, which will neutralize any free acid. This should be applied several times at an interval, say, of a day or two. After that I suggest that the outer inch or so of the gypsum cement be chipped out and that in its place a good grade of Portland cement be applied, which will not be attacked by any future applications of the acid for cleaning, and which will protect the remaining portions of the gypsum cement.

Help at Cleveland

A mine rescue car with full crew was rushed to Cleveland following the recent explosion of gas in the water works tunnel under Lake Erie. H. M. Wolflin, the engineer in charge of the mine rescue work for the Bureau of Mines, was in charge of the car which was hurried from Barnesboro, Pa., in record time. While the first interest of the Bureau of Mines in sending the rescue car was to save the lives of the men, there is much scientific data obtainable at explosions of this kind.

STANDARDIZATION OF ORE SAMPLING METHODS URGED BY T. R. WOODBRIDGE

Despite Importance of This Process, a Large Part of the Sampling Is Not Done on Scientific Basis, He Shows—Bureau of Mines Investigating with Idea of Improving Present-Day Methods

Great need for standardization in ore sampling exists in the West according to T. R. Woodbridge. Mr. Woodbridge spent several days in Washington recently and discussed ore sampling conditions in the West as follows:

"The success of every mining enterprise depends on accurate knowledge of the constituents of the ore taken from the mine. This knowledge may be least necessary for a placer mine or for a company producing bullion from its own ores, but it is absolutely necessary to a company selling its ore, or to a smelter, custom mill, or sampling plant buying the ore.

"In spite of the importance of sampling, a large part of the ore sampling of today is not done on a scientific basis. There are many operators seeking thoroughly satisfactory methods of sampling who, nevertheless, are not doing as accurate work as the present state of the industry permits. On the other hand, investigation shows that in the majority of sampling plants there is a great lack of uniformity, and that even in individual plants several methods or combinations of methods may be found.

"Discussions concerning the theory and practice of ore sampling have appeared at various times in the transactions of the engineering societies and the technical press, but have not resulted in any general uniformity of practice. Especially is this true in regard to discarding methods known to be unreliable. Doubtless some operators are satisfied with this state of affairs and are not concerned with the accuracy of the sampling of individual lots of ore, provided the total purchase price of all lots equals the total value recovered during a certain period of time. Also, a few operators have worked out the problem of sampling for their local conditions to their own satisfaction and profit, and therefore do not welcome any criticism that may result in a change of methods. Most sellers and buyers of ore, however, are frankly disgusted with the persistent use of incorrect methods and would welcome a thorough investigation and discussion of the subject.

"In connection with its efforts to increase efficiency in the mineral industries, the Bureau of Mines has undertaken to investigate present methods of sampling and analyzing ores in this country and to present the facts to all who may be interested in their study and discussion.

"There should be discussion that will ultimately result in the standardization of sampling methods. Sampling would thus be raised from the position of an art to that of an exact science, where it properly belongs.

"The first step forward would be the discarding of methods known to be inaccurate and of methods that, under certain conditions, may be manipulated to give inaccurate results to the advantage of either the seller or the buyer. This would eliminate one of the chief causes of the friction that often develops between the seller and the buyer. At any rate, each party to the transaction should be familiar with the limitations of the method that has been employed by mutual consent, so that neither party will feel that the other is obtaining an unfair advantage."

FAILURE TO MAKE RETURNS DELAYS IMPORTANT STATISTICS

Six months ago the Geological Survey sent out requests to 3,600 operators of placer mines, asking for certain information with regard to their properties. Despite various supplementary requests, only 25 per cent have replied. As a result valuable statistics which would be of service to the entire industry are being delayed.

This is in marked contrast with the returns from many of the metal mining operators. In most cases returns are received from more than 95 per cent of all those of whom the original request is made. In some cases 100 per cent of returns are made.

It is the belief of the geologist in charge of this portion of the work that many of the men engaged in placer mining are operating on so small a scale that they believe the Government does not care to hear from them. Just the contrary is the case. Placer mining as a rule is conducted on a small scale and it is only by getting returns from the individual operator, regardless of the size of his property, that reliable figures can be compiled.

The Survey is spending a great deal of money sending geologists to visit the placer mining sections, and considerable disappointment is voiced at the failure to receive more hearty cooperation. The information requested of placer mine operators is as follows:

State, County and District in which mine is located; name of mine, owner, operator; accessibility; when was placer discovered, period of greatest activity; total production to date; fineness of gold; character of deposits; description of cross sections; color of gold, other valuable minerals; average value of whole deposit per yard; value of pay streak per yard; how is deposit worked; amount of gravel handled; length of season, amount of water used; length of ditch or pipe line; operating costs; nearness of neighboring lode mines. The card containing these questions somewhat more in detail may be obtained on application to the U. S. Geological Survey.

MINERS OVERCOME DISLIKE FOR PERMISSIBLE EXPLOSIVES

Daniel Harrington, district mining engineer of the Bureau of Mines at Denver, Colo., has submitted the following report on the use of permissible explosives at the Hanna mine:

"In May, 1915, Mr. Brennan, of the Union Pacific Coal Co., notified the United Mine Workers of America, through its officials at Cheyenne, that on and after June 1, 1915, only permissible explosives would be used in the Hanna mines of that company. The Hanna mines are gaseous and have had some serious explosions, and Mr. Brennan states that the dust from the Hanna mines is more inflammable, although the coal contains a greater percentage of moisture, than any other coal they mine.

"The miners strenuously objected to the introduction of permissible explosives and it is reported a strike was prevented only by the company promising employment in some of its other mines to any man who did not care to remain at Hanna after permissible explosives were adopted. After the use of permissible explosives was begun at Hanna, complaints were frequent, terminating in a threat to strike in January, 1916. The company prepared a statement regarding the facts in the case, reporting the cost to the miners of permissible explosives for the eight months they had been in use, as against a corresponding eight months in a previous period when the miners were using black powder. From June, 1914, to January, 1915, inclusive, black powder was used and 130,935 tons of coal were produced at a cost to the miner of $0.0405 per ton. From June, 1915, to January, 1916, inclusive, 157,814 tons were produced, with permissible explosives, at a cost to the miner of $0.0378. This indicated that any difference in cost to the miner was in favor of permissible explosives. After studying these figures the miners agreed to continue to use permissible explosives. Mr. Brennan states that the use of permissible explosives in the Hanna mines has not in any way injured the preparation of the coal. The above figures are for coal 'mined' from pillars by shooting off the solid."

HIGH PRICES RESULT IN OPENING OF GRAPHITE DEPOSIT IN TEXAS

The increasing price of graphite has resulted in opening a number of new properties in the United States. Important among these is the mine at Burnet, Tex., owned by the Texas Graphite Company, in which George C. Mau, of San Francisco, is prominently interested.

The deposit has been developed to a sufficient extent to indicate that it is of more than usual value. Much of the graphite is of such high grade that it could have been marketed to advantage under normal conditions. Its presence has been known for many years, but the first effort to mine the graphite was made recently.

PHOSPHORUS FROM IRON ORE MADE INTO FERTILIZER

Another striking instance of the economic evolution which is taking place in the United States today by reason of the European war has just come to the attention of the Bureau of Mines in the announcement that the United States Steel Corporation, through one of its subsidiaries, the Tennessee Coal, Iron & Railroad Co., has just completed a plant at Ensley, Ala., for the manufacture of phosphate fertilizer from its blast-furnace slag.

The Tennessee company, in its making of iron, has been at somewhat of a disadvantage owing to the relatively high phosphorus content of southern ores. Now it has discovered a plan whereby the excess phosphorus in these ores may be converted into a phosphate fertilizer with unusual plant-food qualities. The steel corporation has a double purpose in this, in that it not only removes the impurities from the iron ore but also turns these impurities into salable by-products, thus reducing the cost of iron making. The plant at Ensley is quite complete and is now in working order, but it is too early to give any definite statement as to the amount of phosphate that may be made and the importance of this phosphate in supplying the demands of the country.

The Bureau of Mines is extending its investigations of potash. F. K. Cameron, who has done notable work with the Bureau of Soils, will be added to the Bureau of Mines staff. Mr. Cameron is an expert upon fertilizing materials. Among other things he will write a bulletin on potash.

There are now four government bureaus engaged in investigations of potash problems. They are: The Bureau of Mines, Geological Survey, Bureau of Standards and Bureau of Soils.

J. F. Callbreath, secretary of the Mining Congress, is spending the major part of his time in Chicago, looking after the preliminary arrangements for the 19th annual convention, which will be held at Chicago, November 13 to 17. He reports a great deal of enthusiasm, and the consensus of opinion is that the convention will be the largest ever held by any mining organization.

J. C. Hoyt, of the Water Resources branch of the Geological Survey, is making an inspection trip which will cover portions of Colorado, Utah, Idaho and California. He will be gone two months.

Ralph Arnold, formerly with the Geological Survey, and now in private practice, is in Venezuela, where he will conduct some investigations in the petroleum districts.

GOVERNMENT EXPERTS WELL KNOWN TO MINING MEN

GEO. A. BURRELL
Inventor of Methane Indicator

George A. Burrell is in charge of the chemical laboratory for gas investigations of the Bureau of Mines, with headquarters at Pittsburgh, Pa., where the Bureau maintains its largest experiment station.

Mr. Burrell attended school at Ohio State University, and from there, in 1904, he accepted a position under Professor N. W. Lord, at the coal testing station of the United States Geological Survey. He connected himself with this work at the time Dr. J. A. Holmes became interested in it, and he is now the oldest man, in point of service, in the Bureau of Mines, considering that the Bureau's work began with the coal testing station in St. Louis.

From St. Louis, Mr. Burrell went to Denver in 1907, to take charge of the chemical laboratory of the coal testing plant established there, to study coking and washing of coal from the Rocky Mountain fields. He went to Pittsburgh in 1909, and took charge of the chemical laboratory for gas investigations. He rapidly developed this laboratory from a very small beginning to one where many investigations pertaining to gases have been made.

Mr. Burrell has published, all told, about forty-five articles dealing with various gas problems, including natural gas, gasoline, ventilation of coal mines and gas analysis data, compressibility, liquefaction, physiological effects, explosibility and other data regarding air.

Many gas testing appliances which Mr. Burrell has devised are being used in different testing laboratories in the United States. What he considers his best achievement is his gas detector, recently completed, which is the first reliable, simple and accurate detector for use in mines by inexperienced men. It weighs about one and one-half pounds and is practically all of metal. Firedamp can be detected with it in two minutes' time with an accuracy of one-tenth per cent. It is undergoing finishing touches at the present time in the Bureau's laboratories and shops, and will soon be available for use by the mining public.

Mr. Burrell has not entirely devoted his attention to coal mining, in that, he recently made a study of gases in the Cripple Creek district of Colorado, and also has made many studies pertaining to natural gas and gasoline. He published the only elaborate treatise on the casinghead gasoline industry, and he recently published the first account of a new process for the extraction of gasoline from natural gas by absorption methods.

Mr. Burrell was the first to show the true composition of natural gas by means of experiments performed at temperatures as low as 193 degrees below zero, centigrade scale. These temperatures were obtained by using liquid air. Several years ago he performed experiments that showed that natural gases, rich in heavy hydrocarbons, could be compressed and used from steel bottles for cutting and other purposes. Recent experiments by him show that natural gas measurements at high pressures will have to be revised, in that, in these measurements, natural gas companies have not taken into consideration the fact that natural gas does not follow Boyle's law.

It was principally through Mr. Burrell's experiments and recognition of the value of canary birds for use in mines that these small birds are used considerably in this country in mines following explosions and mine fires to warn rescuing parties of deadly carbon monoxide gas.

A. Knopf, of the U. S. Geological Survey, has completed a field examination of tin ore at Elko, Nev. He also made an examination of tungsten deposits in the vicinity of Bishop, Cal.

ALMOST ANY FUEL CAN BE BURNED SMOKELESSLY SAYS SPECIALIST

By proper combustion of the fuel almost any fuel can be burned smokelessly. It is a question of furnace design and the manipulation of the fire, according to O. P. Hood, of the Bureau of Mines. "The easy way is not the smokeless way, unfortunately," says Mr. Hood, "but if proper principles are observed both in the design and in the manipulation of the fire, as I say, even the so-called smoky coals can be burned almost smokelessly. If you add to that problem a little carelessness or considerable ignorance or a low ideal of what is possible, then you have smoke and dirt and grime. Those are the items which the Bureau of Mines is trying to fight.

"There are some few boilers, usually very old boilers, with which it would be very difficult to produce smokeless combustion with soft coal.

"Just now the Bureau of Mines, in its Pittsburgh testing plant, is making tests on some small housekeeping boilers for the Army that were originally designed for anthracite coal. We have something over 150 different fuels from all over the United States that we are burning in those furnaces, and we can burn the coal smokelessly; but that means that a little more intelligent care has got to be exercised and a little more frequent cleaning of the furnaces has got to be done, but it can be done, and it is done.

"A ton of anthracite coal has less potential heat in it than a ton of good bituminous coal. It is possible, however, by careless use of the bituminous coal to realize a smaller proportion of the potential heat of the coal in your hot-water or steam plant, or in your house, than by an equally careless way of using the anthracite coal. In other words, the anthracite coal is almost a fool-proof coal. That is not so of bituminous coal. But one who learns how to use bituminous coal can get through a year with a fewer number of tons of soft coal than he would use of anthracite. But it takes that little added care and 'know how,' which, unfortunately, most of our Americans will not give. We would rather pay out something more in the way of money than to use a little extra care."

CHEMICAL PRODUCTS COMPANY BUYS LOW GRADE TUNGSTEN

The Chemical Products Co. has erected a large new reduction plant near Washington. The business of this concern has increased decidedly since it began operations here a year ago.

The Chemical Products Co. is engaged in reducing tungsten ores. It makes a specialty of the very low grade ores which find little market at other places. It also is one of the few firms which buys tungsten containing a large percentage of gangue.

ARTESIAN WELLS MADE TO PUMP THEMSELVES

The field men of the United States Geological Survey, in their investigations of the ground-water resources of the Virginia Coastal Plain, have observed that the flows from many artesian wells in that region are utilized to drive hydraulic rams for the purpose of lifting the water to higher levels. Along the lower courses of the Potomac and Rappahannock and along the shores of the many inlets that run back from Chesapeake Bay above the James, there are hundreds of artesian wells that supply a perennial flow of beautifully clear water which is, as a rule, excellently adapted to all domestic uses and is largely utilized by the canning factories and other industrial establishments that abound in that part of the country. Though the pressure of the water from the wells is ample at the short level, the head diminishes so quickly with increase in elevation that no flow can be obtained along the higher banks above the shores where the water is most needed. The common method of obtaining it at these higher levels is to use the force developed by the artesian flow to operate hydraulic rams, which in turn raise the water to the heights desired along the bluffs above the river and inlets. Thus it may be said that the artesian wells pump themselves.

MONTANA BEING SEARCHED FOR OIL AND GAS POOLS

On account of the increasing interest among oil men and in the possibility of developing oil pools in Montana where the oil and gas bearing formations of Canada presumably extend into the United States, an investigation of these structures is being conducted by the U. S. Geological Survey. This investigation is in progress at several points in the state.

One party is in charge of A. T. Hancock. It is studying the structure in a portion of the Yellowstone Valley, above Billings. Another party in charge of C. F. Bowen, is engaged in field examination of an area in the Mussel Shell Valley, near Roundup.

Structure favorable to the occurrence of oil and gas will be the object of a search by A. J. Collier and a Geological Survey party. This party also will map and classify certain coal lands in the northeastern part of Montana.

Visits Magnesium Plants

The magnesium industry of the country is enjoying the greatest boom in its history, according to Frank L. Hess, of the U. S. Geological Survey, who just has returned from a trip to the more important producing centers in those states.

APEX LAW CAUSE OF ONLY THREE PER CENT OF LITIGATION IN MINING STATES

Attorney Compiles Statistics to Bolster His Contention That Extralateral Rights Feature of Present Mining Laws is Not Cause of Unusual Amount of Legal Controversy—Need of Law Revision Discussed

A feature of the mining laws much discussed and perhaps least understood, is known as the "extralateral rights" granted the locator of a mining claim. It is sometimes referred to as the "apex law." This extralateral right was known to miners at the time of the discovery of gold in California and was introduced into the first mining enterprise by the Mexican, English and continental miners. These early miners not only operated their claims with reference to this right but it was expressly granted by their rules and regulations adopted in practically all the mining camps, according to a well-known mining attorney. Others of his views follow:

The principle was not only adopted by the first miners in California, but it radiated to all the other mining districts of the Western States and became a fixed principle in all lode mining.

MINING TERMS EXPLAINED

It was early discovered that veins of mineral-bearing ore were in the form of thin but broadly extended sheets standing or resting at a greater or less angle from the perpendicular, and that the upper edge of this sheet ran along near or at the surface of the ground, and this edge was variously denominated the "outcrop," "apex," or "top" of the vein. This edge, outcrop or apex, as it extended along the surface or more or less below the surface, was called the "strike" of the vein and the angle or downward course of the vein was known as the "dip." This dip varied from the perpendicular from a few degrees, to as much as 80 degrees.

Ordinarily, and in most of the mining districts, these veins have a continuity and an identity as distinct as that of the separate and several roots of a tree, and they can be followed on their dip generally with the same degree of certainty as a person digging down and discovering the root of a tree could follow it out to its remotest extent.

MINING CAMP RULES

The mining claims from the first mining efforts were located on this upper edge or outcrop with a given number of feet extending on the strike of the vein. Under the rules of the mining camps generally the discoverer of a vein was allowed a double portion, twice as many feet on the strike as any other single locator. The claim was then laid on the surface in the form of a parallelogram, the end lines of the claim limiting the locator or miner in his operations on the strike of the vein while the side lines, supposed to run at given distances on each side of the center of the vein, simply measured the amount of the surface ground the miner was permitted to use in the operation or mining out his vein. In the early history of mining, little attention was paid to the side lines for the reason that the land was of no value except in connection with the mining enterprise and the miner was free to use any quantity required along the side of his outcrop, but the limitations on the strike of the vein were invariably strictly enforced and rights recognized and respected.

METHOD OF WORKING

When a claim was thus laid the miner began his operations on the outcrop at the surface and mined out, down and into or upon the vein as it extended downward in its course. The vein between the end lines of his surface location belonged to him absolutely and he had the right to follow it in its downward course any distance that it might lead. Where side lines of his location were required he had the right to pass under these or through the vertical planes of the side lines extended downward and still follow the downward course of the vein the same as if there were in fact no side lines to his claim. These constituted no impediment or no limitation on his underground workings, but only limited his use of the surface of the land.

It thus appears that the term "extralateral rights" indicates the miner's right to follow his vein through or beyond the side lines of his location as made on the surface.

BECAME FEDERAL LAW

When the first mining statute was enacted by Congress in 1866 the senators and representatives from the Western States, familiar with the effects of this extralateral right in practical mining operations, caused it to be incorporated in and made a part of the original mining statute of July 26, 1866. The provision in that act was to the effect that a miner could enter a particular tract and receive a patent therefor, "granting such mine together with the right to follow such vein or lode with its dips, angles, and variations, to any depth, although it may enter the land adjoining, which land adjoining shall be sold subject to this condition."

When this original bill was before Congress, Senator Conness, of California, in his answer to questions as to the meaning of the bill, said:

"The ordinary lands of the United States, not mineral, are sold according to what is called the rectangular system of survey, and always sold by perpendicular lines to the center of the earth. The necessity of varying that law in the sale of vein mines arises because all veins dip at a certain angle, varying frequently, but they always dip at an angle, never entering the earth vertically, and so they run in layers, one after the other. This bill in that respect simply conforms to what is both the custom and the law now—the old custom of the Mexican miners, adopted by our own people, and sustained by the decisions of our courts. Every man now has the right to follow his vein. . . . "

A SENATOR'S OPINION

Senator Stewart, of Nevada, a practical miner, in further explaining the bill, said:

"To extend the preemption system applicable to agricultural lands to mines is absolutely absurd and impossible. Nature does not deposit the precious metals in rectangular form descending between vertical lines into the earth, but in veins or lodes varying from one foot to 300 feet in width, dipping from a perpendicular, from one to 80 degrees, and coursing through mountains and ravines at nearly every point of the compass . . . with such a division of a mine, one owning it at the surface and another at a greater depth, neither would be justified in expending money in cost of machinery, deep shafts, and long tunnels for working of the same. . . .

"If you sell in square sections with perpendicular lines extending into the earth, any quantity you please, one man may have a piece of half a dozen veins, and yet have no vein to work. To open a silver vein costs all the way from $50,000 to several million dollars, and to work it requires long tunneling, and it requires a system of timbering from the top. If a man has only a short piece, and is required to go into the earth by perpendicular lines, he might cut through several veins, but no system of working could be adopted. The veins are separated by rock walls, so that there is no possibility of confusion. You give a man a vein, or so many feet running with the vein, and following it down. Suppose, for instance, you give a man 3,000 feet. It dips forty-five degrees. If you were to undertake to give him that by your present system of selling the land by perpendicular lines, what would be the result? In order to work that vein he must have a large quantity of ground. It is supposed that the veins ordinarily have been worked down 3,000. Then you would have to give him an extent of 3,000 feet laterally. In these 3,000 feet there might be twenty or thirty other veins; so that under that system, in order to give him one vein you would have to give him a complete monopoly of the whole distance, or you would give it to him in a shape that he could not do anything. The practical necessity of the case requires that the dips of the veins shall be followed. A vein is an expensive thing to work, and any other system of sale would destroy the whole country; and that is the principal reason why the miners have been objecting to sales, because the perpendicular line would cut up their claims and no man would purchase. If you undertake to divide the lands in the mining country by having the lines extended perpendicularly, mining will be effectually at an end."

NO CHANGE IN PRACTICE

The nature of mining has not changed. Mining operations are still carried on by following the dip of the vein from the surface downward. Even where perpendicular shafts are sunk by the discoverer of a vein the mining then begins and follows the dip of the vein. The ore found in veins or lodes could not be successfully mined in any other way. The practical value of a vein necessarily depends on the distance that it can be followed by the miner for the purpose of extracting the ore. The experience of the practical miner has taught him that the richest deposits do not appear in the vein nearest the surface but rather appear at a distance of several hundred feet down the incline and if the ore in the upper part or nearest the surface is of sufficient value to contribute somewhat to the expense of mining the operator is rewarded by the richer deposits further down the dip of the vein.

It is but natural that this extralateral right law and privilege has met with opposition. It is against the American instinct of property rights that one man should invade even the sub-surface of the lands of another owner. It is a fact that this right has been productive of difficulties and expensive litigation in some sections. Mining experience has taught that frequently the formations are faulty and regular veins disturbed and broken, and altogether too irregular to be followed, and under such circumstances the extralateral right rule has provoked conflict and litigation. If all veins were regular and ideal there certainly could be no objection to the extralateral right principle.

AS TO LITIGATION

The chief objection to the extralateral right feature of the law, found in the mining literature and encountered among a certain class of critics, is because of the extensive and expensive litigation it has engendered. It is not infrequently asserted that capital refuses its investments in mining enterprises because of the dangers, the expense and the litigation entailed upon the mining operations by reason of this feature of the mining law. Adverse criticism has practically abandoned every other objection to this provision and its repeal is demanded on this sole ground.

The history of mining litigation lends little support to the critics and affords too weak a basis for such a demand, if this objection is to stand as the only one.

LITIGATION ANALYZED

An inspection of the mining cases that have reached the highest courts in nine of the leading metal mining states discloses a very small per cent of the cases that involve any phase of the extralateral right law. The total number of cases involving the great variety of legal questions that have arisen out of the mining operations, cases that but for mining operations would not have been in the courts, the number involving the extralateral right law, and the per cent of the same to the whole number of cases, that have reached the highest courts of the nine leading metal mining states, is shown by the following table:

State	*Mining cases*	*Extralateral right cases*	*Per cent*
Arizona	124	2	1.6
California	764	11	1.44
Colorado	452	21	4.64
Idaho	149	3	2.00
Montana	406	23	5.66
Nevada	196	5	2.55
New Mexico	47	1	2.12
Utah	182	5	2.73
Wyoming	11	0	.00
	2,331	71	3.045

These totals show that in a period of 65 years of mining operations there have been 2,331 mining cases reaching the highest courts of these states, and in this long stretch of time a total of 71 cases that have involved, directly or indirectly, controversies growing out of these extralateral rights.

These 71 cases involving extralateral rights include instances where the litigation grew out of wilful trespasses, cases where one operator knowingly and purposely entered upon a vein belonging to another, as distinguished from an innocent trespass. The list also includes separate suits where one vein owner either with or without a pending suit has sought the order of a court to permit him to inspect the mining operations of the owner of a different vein.

LIST NOT COMPLETE

This list does not and cannot include cases that were terminated in the trial courts either by judgment or compromise; but it is fair to assume that the relative per cent of the two classes of cases settled by judgment or otherwise, was not far different from those appealed to the highest courts. The fair presumption would be that a larger per cent of the extralateral right cases was appealed, from the fact that ordinarily greater financial interests were involved and the parties better able financially to appeal the cases. But for historical purposes the list is sufficiently correct and furnishes a conclusive answer to the demand for the repeal of this provision on the ground of expensive litigation.

Whether or not the extralateral right feature of the mining law is to be repealed should not alone be determined by mining engineers and those who study mining in its scientific aspect. If the law granting extralateral rights is satisfactory to the prospector and the practical miner, it should remain upon the statute books.

CHICAGO CONVENTION AROUSING ETHUSIASM

The Official Call for the Nineteenth Annual Convention of the American Mining Congress to be held at Chicago, Ill., November 13 to 16, 1916, has been issued.

The preliminary work for the convention is well in hand. The program is very much more ambitious than that provided for any previous convention, and the interest thus far manifested is greatly in excess of that shown this much in advance of any previous convention.

Two whole floors of the Hotel La Salle will be occupied; the general meetings will be held in the grand ball room, and the sectional meetings will be held in different rooms on the seventeenth, eighteenth and nineteenth floors. In view of the importance of the work in connection with the convention the secretary will be located at room 214, La Salle Hotel after the first of August. The Washington office will be kept open to carry on the regular work.

The program committee will welcome any suggestions as to speakers and subjects and our members are urged to actively take part in the preparation for the convention as well as the convention itself. It is planned that the coming convention shall be the largest gathering of mining men ever assembled in the United States and the present indications are that this plan may be made successful. The cooperation of every mining man in the United States is requested.

FEAR OF OUTRAGE KEEPS METAL MANUFACTURERS WORRIED

Many of the manufacturers of rare metals are operating with the greatest secrecy. This is made necessary, they declare, by the numerous threats made against them.

In some cases actual attempt has been made to burn or blow up their factories.

While some of their plants are contributing important assignments of war materials to the purchasing agents of the Allied governments, others are engaged entirely in producing products for domestic consumption. This latter class is no freer than the former when it comes to being the target for threats and attacks.

FIGURES SHOWING COAL PRODUCTION BEING FURNISHED MORE PROMPTLY

Cooperation by Railroads Serving Coal Fields Makes It Possible for the Geological Survey to Publish Early Statistics—Over 100 Lines Contribute Data for New Report—More Exact Figures Furnished Later

Hearty cooperation on the part of 104 railroads in the United States is enabling the U. S. Geological Survey to compile and publish additional and timely figures of coal production.

When C. E. Lesher took charge of the coal statistics of the Survey, a little over a year ago, he immediately took steps to ascertain the class of information collected by railways as to the coal shipments originating on their lines.

He found that nearly all railroads entering coal fields had available, promptly after the first of each month, statistics showing the number of cars containing coal and coke which were loaded on their respective lines during the previous month.

The railroads showed interest in the matter from the start, and are contributing the information requested with great promptness.

Blank forms with a franked envelope for their return are sent out from Washington the first day of each month. The blank calls for the total number of cars, or tons of coal, coke or lignite which originates on the line to which the request is sent. Very little information is requested, so as to make the burden of supplying data as light as possible.

The 104 roads which are cooperating in furnishing these figures reach the coal fields in every producing State. Ninety per cent of the bituminous coal, lignite and beehive coke produced in the United States originates on these lines.

These figures furnish much quicker returns on production than are obtainable from other sources. While they are not to be compared for exactness with those collected from the mining companies and available much later, they furnish a valuable check on the more detailed statistics and show the progress of the industry by months.

Get Potash From Searles Lake

The Pacific Coast Borax Company is making successful evaporations of brines from Searles Lake, California. A number of samples of the potash product have been sent to the Geological Survey.

Keith-Smith

Arthur Keith, in charge of the eastern areal work of the U. S. Geological Survey, was married, June 29, to Elizabeth M. Smith, of Washington. Miss Smith has been connected with the Geological Survey for a number of years.

C. E. LESHER

In Charge of Coal Statistics, U. S. Geological Survey.

CALUMET AND HECLA GIVE MEDALS TO OLD EMPLOYES

A general holiday was declared by the Calumet and Hecla Mining Company on the occasion of the fiftieth anniversary of the opening of the Calumet and Hecla mine. The affair was largely an internal celebration among the employes of the company.

The company was host and served a bounteous dinner. Addresses were made and medals were distributed to employes of long service. Copper medals were given those who had been in the service between twenty and thirty years; silver medals went to those who had been with the company between thirty and forty years, while gold medals containing one ounce of the yellow metal were given all who had been on the pay roll of the company over forty years.

HOOD EXPLAINS COMMERCIAL METHOD OF SAVING FUEL

The commercial method of attacking the problem of saving fuel is described by O. P. Hood, of the Bureau of Mines, as follows:

"Take, for instance, a large holding company that buys several electric plants or street railways. One of their first problems is to find out whether the cost of steam is a reasonable cost. Let us assume that they bought a dozen such plants. They send a betterment engineer, as they call him, to each of these plants. His powers are not restricted to the fuel problem, while our powers are, but this will illustrate the proposition.

"The betterment engineer tries to discover just how much steam is evaporated per pound of fuel. He usually asks the local management if they can give him such figures, and nine times out of ten those figures are not available. I think it safe to state that in the $8,000,000 worth of fuel burned by the United States Government, a fraction of but 1 per cent of that is burned under conditions where the cost of evaporating steam is known or can be readily determined. When we go from plant to plant we find the officials in charge do not have in operation methods that will enable them to answer the very first question of costs that a betterment engineer would ask, if he went into that plant.

"As this betterment engineer goes from plant to plant the local management is never in sympathy with him. You could hardly expect a local management who have believed that their methods were entirely proper and correct to welcome with open arms this man who is coming around to see whether they are really efficient or not. And so in the work of the Bureau of Mines in this connection, we can hardly expect the officials of the other departments and the other bureaus to say they will be glad to have us come and make an investigation of their plants and methods of operation.

"It is necessary to find the amount of coal as weighed and used per day and the amount of water evaporated by that coal and to know the methods of handling the furnace in order to obtain cost data.

"Now, after a statement can be made by the betterment engineer of the exact cost per 1,000 pounds of steam generated, this record is usually taken to the local management, who almost invariably express surprise. They were quite sure their costs per 1,000 pounds of steam were low and compared favorably with the best. As a matter of fact, poor operating results are usually due to lax methods, lax administration, and lack of concentration on a particular point, and such usually account for the poor results found by the betterment engineers.

"The betterment engineer then suggests changes. Those changes may be simply changes in the method of handling the furnace, or there may be a slight change in the furnace equipment, or it may extend to advising the use of a totally different kind of coal. It may be a poorer grade of coal, a grade of coal which can be bought for quite a good deal less, but with proper equipment and skill in firing it can be burned and the fuel bill greatly reduced.

"This function of the betterment engineer is not exercised in Government plants, except in rather rare cases, and then by organizations, limited in capacity and number, working in restricted fields, usually overworked, frequently overloaded with routine duties and in the end they generally rely on the fireman who handles the shovel.

"That is the proposition which the Bureau of Mines wants to meet."

BUREAU OF MINES MEN PLAN 10-DAY CONFERENCE

District engineers, foremen, and first-aid miners of the Bureau of Mines will hold at Pittsburgh the last half of August a ten-day conference of such members of the Mining Division as can be spared from their regular duties.

This conference is aimed to be educational and to make toward the standardizing of methods. The field employes will be informed of the latest developments obtained in the laboratories and in the experimental mine. There will be an interchange of information looking to the furthering of the Bureau's purposes in the field. Brief papers will be presented by designated leaders, followed by a general discussion in which each man will be expected to enter. Those employes not present will be given an opportunity to send in written discussion.

Drills will be given in first aid to train the men in the recently standardized methods laid down by the Committee of Consulting Surgeons. There will be a skeleton drill of mine rescue work at the experimental mine following an explosion. There will also be an investigation of an explosion of concealed origin to drill the men in systematic methods to be used in making such investigations. The taking and preparation of coal and of dust samples and of mine-air samples will be demonstrated.

SMALL STEEL PLANTS COMPETE SUCCESSFULLY WITH BIG CONCERNS

Experts here are surprised at the remarkable development which is taking place among small steel companies. Apparently these companies are doing a splendid business and are having no difficulty in competing with the larger concerns. It is believed that this is being done by making grades of steel which require very painstaking processes. In this way a product is secured which is demanding a considerable premium over the average steel turned out by the big plants.

D. H. Smith, of Los Angeles, who is prominently connected with tungsten mining, was in Washington recently.

INTEREST IN GROUND-WATER SUPPLIES BECOMING GENERAL

One of the big recent developments in the building up of the arid and semiarid States is the recovery of underground water for irrigation. Formerly nearly all irrigation supplies were derived from surface streams, but two conditions have in recent years directed attention to the valuable supplies of water which are stored in the huge subterranean reservoirs underlying many of the desert areas of the West and which can be tapped by drilling wells. The first of these conditions is the rapid exhaustion of unappropriated surface supplies and the necessity of finding other supplies if the irrigation of the arid lands is to be extended; the second is the reduction in the cost of pumping due to improvements in pumps, the development of internal combustion engines, and the installation of large hydroelectric power plants.

USE WELL WATER

When the last Federal census was taken more than a half million acres of land were irrigated in the United States with water supplied by wells, about three-fourths of which was pumped, the rest rising to the surface by artesian pressure. Since that time progress has been made in the recovery of underground water. At first ground-water irrigation was almost confined to a few regions, such as southern California, the Pecos Valley, and the Arkansas Valley, but now nearly all parts of the West are being prospected for ground-water supplies.

Owing to the diversity in geologic conditions the occurrence of underground water differs greatly from place to place. Many of the desert valleys have large and valuable supplies; but others which appear no less promising to the casual observer have little or no underground water or only water that in many cases has become too alkaline to be used for irrigation. The uncertainties attending ground-water developments are causing great loss and suffering to thousands of uninformed and inexperienced settlers and they are providing unscrupulous promoters with opportunities for misrepresentation.

A GROUND-WATER SURVEY

Long before the interest in underground water had become as general as it is today the Geological Survey foresaw the need of a detailed ground-water survey of the entire West, and for years it has been engaged upon such a survey. Each year certain areas are selected for systematic investigation, the plan being ultimately to cover the entire West. A vast amount of reliable information has thus been obtained on the quantity, depth, and quality of the water, the prospects for artesian flows, the best methods of constructing wells, the cost of drilling and pumping, and other matters relating to the recovery and utilization of the underground supplies, and maps are made showing the ground-water conditions. These maps and data are published in a series of water-supply papers.

The region to be covered is, however, so extensive and the funds available for water-resources investigations have been comparatively so small that large areas remain in regard to which there is no definite information, and many years will be required at the present rate of progress to cover all of these areas, provided the work is to be done with the thoroughness that is essential to make it useful. Every year many requests for investigations of specific areas are received, some of them in the form of long petitions signed by the settlers. All of these requests are given careful consideration, but it is possible to respond favorably to only a few of the most meritorious.

VALUABLE INFORMATION

The people's appreciation of this service is shown by the large number of requests for information and advice that are constantly received by the Geological Survey. Some of the water-supply papers are so much in demand that the editions for free distribution are exhausted within a few weeks after the papers are published.

The list of publications of the Geological Survey contains nearly 100 reports dealing with the underground waters of the Western States. The water-supply papers that are still in stock can be obtained by addressing the Director, United States Geological Survey, Washington, D. C. Many of them are now out of stock at the Survey, but most of these can be purchased at cost from the Superintendent of Documents, Government Printing Office, Washington, D. C. A complete list of the publications of the Survey can be obtained by anyone on application.

GEOLOGICAL SURVEY'S DIVISION OF GEOLOGY REORGANIZED

To lessen the administrative work of two chiefs of sections of the division of geology of the U. S. Geological Survey, the following reorganization has been made:

1. Section, Eastern Areal Geology, Arthur Keith, geologist in charge.
2. Section, Western Areal Geology, Sidney Paige, geologist in charge.
3. Section, Geology of Metalliferous Deposits, F. L. Ransome, geologist in charge.
4. Section, Geology of Non-Metalliferous Deposits, H. S. Gale, geologist in charge.
5. Section, Coastal Plain Investigations, T. W. Vaughan, geologist in charge.
6. Section, Glacial Geology, W. C. Alden, geologist in charge.
7. Section, Paleontology and Stratigraphy, T. W. Stanton, geologist in charge.
8. Section, Geology of Western Coal Fields, M. R. Campbell, geologist in charge.
9. Section, Geology of Eastern Coal Fields, G. H. Ashley, geologist in charge.
10. Section, Geology of Oil and Gas Fields, David White, geologist in charge.

THE
MINING CONGRESS
JOURNAL

PUBLISHED EACH MONTH BY
THE AMERICAN MINING CONGRESS.
Munsey Building. Washington, D. C.

Subscription Rate, per year............. $2.00
Single Copies.......................... .20

Entered as Second Class Matter January 30, 1915, at the Postoffice at Washington, D. C.

AUGUST, 1916

EDITORIALS

PROPOSED COPPER TAX UNFAIR AND VICIOUS

It is almost incomprehensible that serious consideration can be given to the proposal to single out a specific productive industry and to heap upon it burdens of taxation which are not assessed against other similar lines of business, and which in the end and during the greater part of the time which it will be in operation will fall most heavily upon the laborers engaged in the industry. Had not this proposal already been passed by the House of Representatives, the MINING CONGRESS JOURNAL would not give serious consideration to so vicious a proposal.

The proposition referred to is contained in H. R. 16763, otherwise referred to as the revenue bill, and is couched in the following language:

> "Every person smelting copper ore or copper concentrates, refining metallic copper, or alloying copper, for each taxable year an excise tax equivalent to the following percentages of the gross receipts during such year of the sale or disposition of refined copper, or copper alloy, and from the sale of disposition of crude or unrefined copper if sold or disposed of for any purpose except for refining or alloying.
>
> "One per centum of the amount by which such receipts exceed $25,000 and do not exceed $1,000,000; 2 per centum of the amount by which such receipts exceed $1,000,000 and do not exceed $10,000,000 and 3 per centum of the amount by which such receipts exceed $10,000,000."

This bill was passed by the House of Representatives by a vote of 239 ayes to 139 nays.

To establish the principle that special taxes shall be assessed upon any industry which temporarily becomes especially profitable would create an unstable basis for governmental support.

We hear much in these days about preparedness. If there is an industry in which preparedness for war and preparedness for peace, both require a continuous development, the copper industry must be so ranked. This particular industry has shown that in time of emergency it is able to supply a most vital requirement should this country ever be involved in war and in times of peace it has done its full share in bringing to this country a large percentage of the world's gold supply, which in its turn would be equally important for proper war equipment, should the future involve us in foreign complications.

The copper industry, through the income tax, the corporation tax, and the extraordinary burdens of state taxations, is already paying more than its full share for the support of the government, and the extraordinary tax proposed in this bill will become extremely burdensome when the price of copper shall again have reached a normal level.

The fact must not be overlooked that wages, a large part of production costs, are regulated by a sliding scale based on the market price of copper; and that copper mining is largely carried on at a few important centers employing large numbers of men, at which point no other vocation is open to those who are so engaged. To discontinue the sole support of a large population at points where other employment is impossible, and where food supplies are very costly and available only in exchange for cash, leaves the wage earner in the copper industry in a very serious situation. To select this one industry for special and unbearable burdens will be a political blunder likely to be resented by those who control the political destinies of some of the copper producing States.

CONVENTION KEYNOTE IS COOPERATION

(From the Official Call for the Nineteenth Annual Convention of the American Mining Congress)

Cooperation for better conditions is to be the key-note of the convention. A better understanding between employers and employes is one of the most important subjects for consideration. The truth of the issues involved is to be told plainly but without offense. Conditions must be understood and faced if remedies are to be provided.

He who takes offense at a statement of the truth has need to revise his views or be a continuing hindrance to progress. If mistaken notions prevail no better plan of eradication is possible than through an open discussion in a friendly spirit with a view to bettering conditions.

Cooperation is the great need of the Mining Industry. The great purpose of the convention will be to inaugurate plans by which all branches of the mining industry may work together for the solution of common problems.

CHANGE OF BY-LAWS PROPOSED BY MR. SCHOLZ

A letter from President Scholz calls attention to the advisability of providing a different method of election of officers of the American Mining Congress than that which is now provided by the by-laws. The suggestion grows out of the fear that those members who are not able to attend the annual meeting and take part personally in the election of directors may be justified in suspecting that they have no part in choosing the officers who are to control the organization. It is most important that every member of the organization shall feel a sense of responsibility in the management of its affairs and it would seem wise that this matter should be publicly discussed through the columns of the Journal in order that if a change of system is desired that it may be made at the coming annual meeting of the Mining Congress to be held during the week of the Chicago Convention.

In the early history of the organization when its activities consisted entirely of the annual convention composed of delegates only, the officers were elected at the annual meeting by the delegates present. Later, when the organization was incorporated and regular membership created, only active members of the organization were legally entitled to vote. As the organization assumed broader functions and its membership increased, it became increasingly difficult to secure the attendance at any meeting of a quorum of its members. The plan was then adopted to permit the absent members to be represented by proxy. This system has worked with reasonable satisfaction although the proxies have usually been centered in the secretary. While it is true that these proxies have never been used except to be counted for the making of a quorum and the members who were present at the annual meeting have always fully controlled the meetings, the proxies not being voted, yet the system is open to the objection that the secretary has the power to cast a controlling vote by this system.

The by-laws of the Congress have been frequently changed to meet the needs of changing conditions. A growing membership seems now to need a further change by which the members may have a more direct influence in the election of directors.

One difficulty, however, must be kept in mind, viz.; that a quorum of the board of directors must be present in order that the executive committee can be legally elected through which the executive functions of the organization may be made effective.

President Scholz proposes that there shall be a geographical division of the country made and that the by-laws shall provide that a certain number of the members of the board shall come from each of these geographical divisions. It seems also important that the members of the board of directors shall represent at least to some extent the various branches of the mining industry for which the organization undertakes to speak. It has been suggested that a committee shall be appointed to work out an entire revision of the by-laws of the organization. The MINING CONGRESS JOURNAL will welcome a discussion of the subject. Members who have mislaid the by-laws will be supplied upon application to the secretary.

MINE MANUFACTURING CAPITAL'S OPPORTUNITY

A recent editorial in the *Engineering and Mining Journal* digests very comprehensively the methods of mine development which have been most successful during the last few years, and points out very clearly that the rejection by the larger development companies of a mine which had been offered, does not reflect upon the proposition offered, because the very same mine might be desirable to some other company, or at some different price. The editorial says:

"Not only is the field of opportunity not barren, but there is a marked need of an exploitation company for the handling of comparatively small properties."

The MINING CONGRESS JOURNAL has repeatedly urged the importance of the development of prospects, and has pointed out the importance of having other mines available for the utilization of capital, brains and energy now employed in mines which sooner or later will be exhausted. It has pointed out the importance of contemporaneous development of a large number of prospects in order that the loss entailed by the unsuccessful development of some prospects may be offset by the success in the few which become profitable mines.

The manufacture of mines (the development of prospects), offers a field giving promise of large profits to capital and great benefit to the communities in which the development work is done.

FOSTER WORKS HARD FOR MINING APPROPRIATIONS

Dr. Martin D. Foster, Chairman of the House Committee on Mines and Mining, is entitled to much credit for the active way in which he fought for the increased appropriations for the Bureau of Mines. He was tactful and determined throughout and to him in no small measure is due the success of legislation which has added materially to the appropriations allowed to this Bureau.

Despite the fact that Dr. Foster is very much opposed to the American Mining Congress' recommendation that a commission be appointed to study the needs of the country with respect to mining laws, we can say that there is no doubt as to Dr. Foster's conscientiousness. We are very certain that he is only being true to his convictions in his efforts to prevent the carrying out of this recommendation.

Regardless of the fact that few of Dr. Foster's constituents are interested in mining, it can be stated that he is a very hard worker in the interest of the mining industry. We never have given up the hope that Dr. Foster will yet be convinced of the absolute necessity of a revision-of-laws commission. Once that he is convinced, he is the type of man who does not hesitate to change his position, and it may be that he will become just as ardent a supporter of the American Mining Congress' recommendation as he has been its opponent.

SHOWS CONFIDENCE IN BUREAU OF MINES

If no additional appropriations are granted during the next two and one-half years, the Bureau of Mines, through additional funds to be provided for mining experiment and mine safety stations that have already been authorized by Congress, will have the direction of an annual expenditure aggregating $1,500,000.

The value of the work being done by the Bureau of Mines is so evident that Congress is showing more than ordinary confidence in this Bureau, and each year is placing additional funds in its hands to aid the mining industry.

What better improvement could be made than to install and adopt the electric method of firing explosives instead of the old method of fuse and blasting cap?

LITTLE HARDSHIP WITH MUCH PLEASURE AND PROFIT IN TRIP DOWN THE YUKON

Geological Survey Official Gives Detailed Information as to the Needs of Such a Trip— Skiff Made on the River More Appropriate for the Journey Than a Canoe— Summer Clothing Only Needed

An official of the Alaskan division of the Geological Survey has answered a request for advice as to a trip down the Yukon as follows:

A trip from Whitehorse to Tanana Alaska by canoe can be undertaken with very little hardship or inconvenience by anyone used to roughing it and with a fair assurance of pleasure and profit, depending, of course, upon the temperament and tastes of the persons involved. There are few rivers that offer scenery, climate, and ease of travel equal to this reach of the Yukon. From Whitehorse to Lake Lebarge the river is 200 to 300 feet wide and flows through a broad silt-filled glaciated valley. The lake is a beautiful, clear blue body of water, thirty-four miles in length, comparatively narrow and bordered by low glaciated hills that preserve to a great degree the marks of the last ice advance. Below the lake the clear blue waters of the Thirtymile River follow a sinuous course through a continuation of the same glaciated depression to the mouth of Hootalinqua River where the more turbid waters begin.

Below this point to Dawson the river increases in size and velocity, and the valley, losing its broad, open aspect, becomes almost gorgelike in form, cutting through uplands 2,000 to 3,000 feet higher than the stream. From Dawson to Circle the river is nearly half a mile in average width, and the valley retains its deep and narrow form. The current here is 5 to 7 miles an hour and fine progress can be made without effort. Below Circle the river spreads into numerous channels in a great silt-filled basin known as the Yukon flats within which, at Fort Yukon near the mouth of Porcupine River, it reaches its most northerly point, within the Arctic Circle. About 200 miles below Circle, at old Fort Hamlin, the Yukon leaves the Flats and enters the first of a series of gorges that occur at intervals the rest of the distance to Tanana.

CLIMATE DELIGHTFUL

The climate of the region during the season mentioned is generally delightful. The weather is usually clear and warm, temperatures ranging betwen 50° and 80°, night and day, and with little wind or rainfall. The rain is mostly from local thunder storms of the middle western type.

The current of the river throughout this reach is good, ranging from 4 to 7 miles an hour, so that good progress can be made with little exertion. It is necessary only to keep in the current, look out for sweepers or trees leaning out over the water along cut banks, and to seek local advice about the Five Finger and Rink Rapids, which lie halfway between Whitehorse and Dawson. Experienced boatmen have no difficulty in running the right channel of the Five Fingers and in going down the right bank at the Rink Rapids. There is a bit of swift water in the Lower Ramparts half way between Rampart and Tanana, but it is all clear and safe on either side of mid-channel where a rocky island is generally exposed.

A canoe is not essential for the trip unless side trips up tributary streams are planned. A more economical type of boat and one more comfortable for floating on the main river is the so-called Yukon skiff, which may be bought from local builders at Whitehorse for $15 to $20, according to size. These boats are steady and have lots of room, so that a stove may be set up on board and cooking done en route—a common practice with "floaters." Such a boat will carry 1,000 pounds or more of luggage without crowding, permitting cots, camp chairs, and a steamer trunk to be carried if one desires such luxurious equipment. The Yukon skiff is a flat-bottomed, square stern boat, 16 to 18 feet long and 3½ to 4 feet wide at top of flared gunwales. The stove commonly used is made of sheet iron and may be bought at any settlement.

MOSQUITOES BOTHER

The mosquitoes and gnats bother one very little while on the river, but they are very troublesome on shore, and it is essential to have a mosquito-proof tent for sleeping quarters. A very satisfactory type is made for Survey parties by the Seattle Tent & Awning Co., Seattle, Washington—an 8x8 tent costing $25 to $30. An extension fly of similar size, to be attached in front of the sleeping tent, under which cooking may be done, can be added for about $15. An asbestos ring for the stove pipe should be used if the stove is to be set up under shelter.

It is also essential to have mosquito nets and gloves for use on shore, especially at evening. A good type of head net is sold by C. C. Filson, Seattle, for 75 cents. Ordinary summer-weight clothes will be generally worn, but a mackinaw or slicker is handy for rainy days. Hobnailed surveyor's boots and rubber wading boots worn over heavy wool socks are best footwear on shore.

The principal fishing will be found on the clear-water tributary streams rather than in the main river. Grayling are available in practically all such streams and may be taken with ordinary rod and fly. Brook trout are abundant on many of the swift tributaries, more so perhaps near their headwaters than farther down. An excellent small white fish can be caught along the margins of the Yukon by gill-netting, and a small net set at evening usually will catch a nice breakfast by morning. A fine 1½ mesh net has been used successfully by Survey parties for this purpose. Salmon run far up the Yukon and may be had for little or nothing from natives or local fishermen after the first of July.

MOOSE AND BEAR ABOUND

Moose and bear are seen not infrequently along the Yukon, and local inhabitants can direct one as to best localities for special hunting and also concerning game laws. However, as meat will keep for only a limited time during the summer months, it seems hardly worth while to kill a large animal for the sake of a few days' rations for a small party. Geese, ducks, cranes, etc., are to be found on lakes and bayous along the river and on the tributary streams, and a good shotgun is probably more satisfactory for supplying the larder than a large caliber rifle. Ptarmigan are to be had on the high hills during the summer and grouse are generally plentiful in the timber along the streams. These birds are easily killed with a 22 caliber rifle, and this weapon is generally used for the purpose by Survey parties.

Supplies may be purchased at any of the settlements along the river, so that it is unnecessary to take a complete outfit from the States or from Whitehorse. Horses for side trips may be hired at any of the settlements below Dawson.

The lower river is more or less monotonous, especially below the Koyukuk. Side trips on the upper Yukon would probably prove a more interesting way to spend time.

PUBLICATIONS

Among the publications of general interest to one contemplating such a trip are: "Early Days on the Yukon," by Ogilvie. "Through the Yukon and Alaska," by Richard, and "Handbook of Alaska," by Greely. Maps and reports on the upper Yukon, in Canadian territory, may be obtained from the Geological Survey of Canada, Ottawa, Canada.

If a canoe is desired a moderate size (17 or 18 foot, No. 66x, 67x, or 68x) Peterboro will probably be found best. In this event one may write the Peterboro Canoe Co., Peterboro, Ontario, Canada, for catalogue and list of their Pacific Coast agents. Unless the company has an agent in Whitehorse the canoe should be taken from Seattle, Victoria, or Vancouver. It possibly would be best to have it shipped direct from Vancouver or Victoria to Whitehorse to simplify customs charges. No duty would then be required excepting on entering American territory at Eagle. The canoe will cost, including purchase, freight, and duty, at least $100 more than the skiff, and the latter will be more satisfactory unless one is ambitious to paddle or want to run up the tributary streams. If a canoe is taken it would be best to fit it with oars.

The people of the district are cordial and willing to furnish information and advice.

New Publications Announced

The Bureau of Mines just has received for distribution the following:

Bulletin 106. The technology of marble quarrying, by Oliver Bowles.

Bulletin 115. Coal-mine fatalities in the United States, 1870-1914, with statistics of coal production, labor, and mining methods, by states and calendar years, compiled by A. H. Fay.

Bulletin 118. Abstracts of current decisions on mines and mining, reported from October to December, 1915, by J. W. Thompson.

Technical Paper 117. Quantity of gasoline necessary to produce explosive conditions in sewers, by G. A. Burrell and H. T. Boyd.

Technical Paper 121. Effects of temperature and pressure on the explosibility of methane-air mixtures, by G. A. Burrell and I. W. Robertson.

Technical Paper 145. Sensitiveness to detonation of trinitrotoluene and tetranitromethylanilin, by G. B. Taylor and W. C. Cope.

Working in South America

D. F. Hewett, of the Geological Survey, is in Peru, South America, conducting some geological work for a private mining concern.

Geologists connected with the Survey are permitted to do a limited amount of private work in foreign countries. The education that they acquire in this manner while on leave without pay is of decided advantage to the Federal service.

Maximum Execution Assured

When explosives are detonated electrically the maximum execution is always assured. The blast cannot occur until the miner desires it and when everyone is in a safe place. As many holes can be fired at one time as desired so that it is possible to use less explosives per ton of coal than when fired by fuse and blasting caps.

(Continued from page 349.)

collector from taking the tax from the owner of a large amount of cotton. The point was made that this was a direct tax which could not be legally collected and that as cotton could be raised in only one locality, that the imposition of the tax was in contravention of the uniformity clause of the Federal Constitution. The lower court refused to issue the injunction, and an appeal was taken to the Supreme Court, but no decision was had for the court, even in that day of intense prejudice, evenly divided on the questions submitted.

But, Mr. Chairman, whatever the court may or may not hereafter hold, the fact remains that the tax is discriminatory, laid without reason on one particular product, and laid with such a heavy hand as to bankrupt many struggling mines in my State and falls on labor as heavily as on the capital invested in the production of copper. Much of our labor is paid a scale depending on the net price of the copper produced by it. This tax is a direct imposition on the men working in the mines. They at last must pay at the point of production. Copper is high today, it may be low tomorrow. The price is already declining, and must expect further decline when Europe shall have regained its senses and turned to paths of peace, just as zinc, lead and steel will decline, but probably in a smaller ratio, for as Senator Walsh has shown that the export of copper has been about the same through the war period as it was before the war started, while bar steel increased its exports from $2,000,000 worth in the first four months of 1914, to $14,418,000 for the same months in 1916. Even a greater increase in exports is shown in zinc, pig iron and lead, and the prices of all of these untaxed metals rose equally with copper and some of them command and still hold prices much in excess of any rise in the copper market.

In view of these facts, can it enter into the mind of man to conceive the reason for specializing copper for enormous taxation by the Federal Government? It bears a great part of the burden of taxation for the support of my State, and the other few States in which it is found. Enormous sums of money have been expended in developing paying mines of copper, and in the aggregate still larger sums have been spent on mines that never paid.

Mr. Chairman, I will conclude as I began, by commending the argument of Senator Walsh to your thoughtful consideration. He has left little, if anything, to be said by me or anyone in defense of our position, and I have detained you this long, more for the purpose of recording my determined and unflinching opposition to the imposition of this unjust tax rather than to throw any further light on the question at issue.

LETTERS PUT IN RECORD

Senator Smith made a part of the record in his testimony a number of letters from authorities on copper which contains some splendid arguments. These letters were from Walter Douglas, vice-president of the Phelps-Dodge Company; L. D. Ricketts, of New York; C. H. Akers, president of the company publishing the Phoenix Gazette, and Charles F. Willis, Director of the Arizona Bureau of Mines.

A very strong argument was made against the tax by H. H. Boyseen, of the American Brass Company of New York. This Company makes about half of the brass manufactured in this country. He testified that the company buys all of its copper and zinc in the open market and does not produce a single pound of metal itself. He also pointed out that 85 per cent of the brass now being produced in the United States is going into peaceful uses. Alfred B. Reeves, representing the United States Metal Refining Company, stressed the point that copper is no more a munition of war than is cotton.

If no other reason exists for the elimination of this tax from the bill it would be justified by the fact that it would put a stop to the successful business that is beginning to be built up in this country in the smelting of foreign ores, stated Julien B. Beaty of New York, representing the American Metal Company, who appeared before the subcommittee.

A valuable contribution to the record on the copper situation was a brief by Vice-President Kelley of the Anaconda Copper Co.

Senator Warren called the attention of the Senate to the following telegram from the Utah Chapter of the American Mining Congress. He inserted the telegram in the *Congressional Record*. It reads as follows:

> We note that the Ways and Means Committee has reported favorably on a proposed bill to tax copper smelting and refining for additional revenue. We, representing the mining interests of Utah, seriously object to the passage of such bill, classing the copper business as war industry. If the law is enacted it will seriously injure mining companies and be a great blow to mines in the Western States. Utah Chapter of the American Mining Congress solicits your earnest efforts to defeat this provision of the revenue act.

In protesting in the House against the tax on copper, Mr. Hayden said:

"I have offered this amendment because, after careful consideration, I have reached the conclusion that the proposed tax on copper is unjust in that it discriminates against the leading industry of my State.

"It is true that the bulk of this tax will be collected from the refiners and alloyers of copper, but I trust that no member present will insist that the revenue thus obtained will actually come out of the pockets of those who 'manufacture' copper, as the bill describes it. The refiners and alloyers cannot pass the burden on to the consumers by adding the tax to the price of their products, because refined copper and brass are sold in a world market, where the price is regulated by supply and demand. But the refiner can, and will, recoup himself by either increasing the refining charges or by reducing the price paid for unrefined copper. Therefore, this is a tax upon production that must ultimately be paid by those who mine copper ores.

"This tax dates back to January 1, 1916, and the amount due for this calendar year must be paid on or before April 1, 1917. The United States Geological Survey recently estimated that at the present rate of production over 600,000,000 pounds of copper will be produced in Arizona in 1916. This is nearly twice the output of any other State, and represents over one-third of the copper produced in the United States. Six hundred million pounds of copper at an average price of 25 cents a pound equals gross receipts aggregating $150,000,000 that will be subjected to taxation. The maximum tax under this bill is 3 per cent, but presuming that advantage is taken of that other provision of the bill which allows a net profit of 10 per cent on the amount actually invested in the 'manufacture' of copper, still it is safe to assume that this tax will yield a return of 2 per cent on the gross output. In that event, at least $3,000,000 will be collected from the copper produced in my State.

"Now, those who mine copper in Arizona are as patriotic as any other body of Americans. They are willing to pay a fair share of the cost of preparedness, but they do object to having copper singled out for double taxation while no such discrimination is practiced against any other metallurgical industry. As a matter of fact, this bill provides for triple taxation of large quantities of copper. First, the refiner must pay a tax on the gross receipts of his business. Then the alloyer, who purchases the refined copper that has once been the basis of a tax, is taxed on his gross receipts. The alloyer sells brass to a munition maker, who must pay a tax on the gross amount he receives for the cartridges and other war material he has sold. A pound of copper that follows this course will, in all probability, be used as a basis for at least a 2 per cent tax paid by the refiner, another 2 per cent tax paid by the alloyer, and still another tax of at least 4 per cent paid by the munition manufacturer. I am sure that the Committee on Ways and Means could not have given much study to the effect of this double and triple taxation of copper or certainly they would not have included this form of raising revenue in the bill.

"I do not offer this amendment upon the theory that it will confer a special privilege upon the copper producers of my State, but I do insist that they shall not be discriminated against.

"We are all agreed that the munition industry has been enjoying exceptional prosperity and the profits derived therefrom are therefore a fit object of temporary taxation. We know that this industry has reached its maximum growth and no one contends that this unusual tax is expected to remain on the statute books for more than a year. Except as to copper the tax will practically repeal itself when the shipments of munitions to Europe shall cease. I understand that the committee considers that the necessity for this tax will end whenever the inheritance tax is in full operation.

"The production of copper, upon the contrary, is a permanent industry the prosperity of which is vital to our national welfare. Without asking for or receiving any favoritism by legislation, such as a protective tariff or any other special privilege, the output of copper has steadily and legitimately increased until the United States now leads the world in the production of this red metal, without which the present electrical age would be impossible. Why, then, should this, rather than the other metallurgical industries, be especially chosen to contribute to the cause of national defense at this time?

"It is true that the producers of copper are now enjoying great prosperity, but they have justly earned this reward by passing through a period of depression as the result of embargoes and unfriendly legislation like the English orders in council declaring copper to be contraband. Shortly after the beginning of the European war the production of copper almost ceased, and thousands of miners were either thrown out of work or employed on half time at reduced wages. Under the circumstances I feel that the copper industry should, in all fairness, be allowed to enjoy its present prosperity. I suspect that the real reason for this tax is that the committee has associated copper with munitions on account of the large amount of this metal that is used in making war material.

"I would like to inquire why copper has been taxed in this bill and no tax has been placed upon steel? If copper is to be taxed because it enters into the manufacture of munitions, why has not steel been taxed for a similar reason?

"This tax, like any other element that enters into the cost of production, will have nothing to do with the price of copper. But steel is used to make cannon and shells, small arms and other war use from barbed wire to battleships. Yet there is no tax on steel ingots or billets in this bill. If there is to be double taxation of copper because it is used in making munitions, why should not steel also be twice taxed? Everyone knows that vastly more steel and iron is used in modern warfare than any other single metal.

"In addition to copper and iron all of the other metals have advanced in price owing to the demand created by the European war. Lead and antimony are used to make bullets and shrapnel. Aluminum is required for aeroplanes, Zeppelins, and automobiles. The manufacture of projectiles and armor plate makes a market for nickel, and quicksilver is used to make priming explosives. A vast quantity of zinc is consumed in the form of brass and to galvanize barbed wire. If copper is to be taxed, why ignore these metals? There is no double taxation on any of these articles in this bill.

"As a matter of fact, the greater part of the copper produced in this country is used in our domestic arts and industries. In 1914, when such a thing as exporting munitions of war was undreamed of, over 700,000,000 pounds of copper, or about one-half of the total production, was consumed in the United States. It is safe to say that even a larger amount of copper will be used this year in America in a manner not even remotely connected with the war. Certainly it is a misnomer to call this a munitions tax when the greater portion of the copper upon which the collections are based is used for peaceful purposes.

"It cannot be possible that this tax is to be levied merely because the copper industry can afford to pay it. I hope this House will not settle upon the policy of taxing prosperity whenever it appears. The English kings practiced that kind of extortion on the Jews of York, but no political economist will recommend such a proceeding, even as an extraordinary method of raising revenue.

"If Congress is to tax the copper industry because it is profitable, then consistency demands a like tax on steel. Only last Saturday Henry Clews, that great student of financial and business conditions, gave out this statement:

" 'The steel trade positively is suffering from overconsumption. Production is operated at the limit, yet there is no cessation in the pressure of orders, no signs of weakness in prices, and the steel mills would welcome a respite from the urgent demands of consumers.'

"I defy anyone to name a copper stock that has advanced from $30 to $530 a share, as did Bethlehem steel as a result of the munitions traffic. Why should not the steel industry, that pampered pet of protection, whose demands have been insistently presented to the American people in every political campaign for the past fifty years, after having been fed with favors by law, now that it is prosperous why should not its profits be directly taxed to pay for a program of preparedness that will require more steel than any other metal? There are no two ways about it. Either steel should be taxed or copper should not.

"There is a matter I want to draw to the particular attention of the friends of labor in this House. I have been discussing this tax from the point of view of the owners of the producing mines in Arizona whose property is assessed this year for purposes of State and county taxation at a valuation of over $170,000,000, but I would have this House remember that Congress cannot levy a copper tax which will not also be a burden upon the 30,000 men who are employed in mining and ore reduction in my State. More than $35,000,000 will be paid in wages this year to these men, but the wage varies directly with the price of copper. If you put this tax on copper, you reduce the wages of the men employed in its production. I ask you to impose these taxes in such a way that no part of the burden can be shifted onto the laboring man.

"A tax of 2 per cent on copper at 25 cents a pound means only a half cent on each pound, which does not sound like a very heavy burden. But a half cent a pound on 600,000,000 pounds means $3,000,000 that must be raised from the copper industry in Arizona. Does anyone here believe that those who labor in Arizona's copper mines will not share this burden? The friends of labor in this House will therefore vote with me to prevent a reduction in the wages paid to the miners and smelter men of the greatest copper-producing State in the Union.

"The gentleman from Tennessee has said that there are two supreme duties which a citizen owes to his country—to fight for it and to pay taxes. In answer to the President's call for soldiers to protect the Mexican border there are more men under arms today from Arizona in proportion to her population than from any other State in this Union. Not content with receiving this liberal offering of the blood of her sons to defend the Nation, this bill proposes to seize the treasure of Arizona by an unfair and discriminating tax upon her leading industry. I would be unfaithful to the trust that has been reposed in me if I did not raise my voice in protest against this injustice."

CONDEMNS TAX

Commenting on the tax on copper, the Washington *Post* recently said editorially:

> It was natural that the citizens of Montana, Arizona, Utah, Michigan, Connecticut and New Jersey should strongly protest against the proposed tax on copper. There can be little doubt that after the Senate has carefully considered the matter, this particular item of the revenue raising bill will be eliminated.
>
> While such a tax would not be popular politically, it is upon entirely different grounds that the Senate must consider the matter. In all probability the tax on copper would be unconstitutional, but, more than that, it would be so unjust that the Senate is not likely to permit it to stand in the bill.
>
> There is no more excuse for including copper under the heading of "munitions of war" than there is for including cotton or foodstuffs. The mere prosperity of an industry certainly is not sufficient cause for discriminatory taxation.
>
> Copper does not enter into the manufacture of munitions any more than steel, lead, antimony, aluminum, quicksilver or zinc. Any one of these ingredients of munitions might have been taxed under the same specious argument. The revenue bill, however, not only hits copper once, but three times. Under the terms of the measure as sent to the Senate by the House, the refiner must pay a tax on the gross receipts of his business; then the alloyer must pay, and finally the munitions manufacturer who turns out the finished product must pay. In all probability there would be a 2 per cent tax paid by the refiner, another 2 per cent paid by the alloyer, and still another tax of 4 per cent paid by the munitions maker.
>
> Direct taxes are never welcomed very warmly by the people, but if they are not discriminatory they must be regarded as inevitable.
>
> Since taxation at the present time seems to be inevitable, it is for the Senate to see to it that there is no injustice or unfairness. A copper tax has no place in the revenue raising bill. It is understood that the Senate will eliminate the tax and such a result will be gratifying, as an evidence of the Senate's sense of justice, even to those who are not in any way affected by the proposed levy.

DU PONT COMPANY PROTESTS AGAINST MUNITIONS TAX

In a letter to members of the House Committee on Ways and Means, the du Pont Company, powder makers to the belligerent countries of Europe, present the "other side" of the Democratic proposal to tax heavily the production of munitions of war. The mining industry is directly interested in the munitions trade since it is one of the largest consumers of metals.

No hearings were held by the House Committee before it reported the emergency revenue bill. The du Pont Company presents arguments that the bill discriminates against the makers of explosives.

It is claimed that the bill means double taxation for the munitions makers—because they pay an income or corporation tax on net income and a special munitions tax on gross receipts.

POINT TO OTHERS

The argument is also advanced that manufacturers of other articles that have been exported in large quantities and at high prices escape special taxation, the munitions makers being singled out in casting about for a levy on "war orders."

For instance, the du Pont Company says that millions of dollars' worth of automobiles, aeroplanes and parts, rubber and woolen goods have gone to the belligerents, but there has been no proposal to tax this class of war trade.

While admitting that munitions makers have had good contracts and dividends, attention is called to the temporary nature of the traffic and the vast improvements that have been made at heavy expense to meet the demands. Owing to the interest of the mining industry in this question the letter from the du Pont Company is reproduced in its entirety, as follows:

TEXT OF LETTER

"Claude Kitchin, Chairman, Ways and Means Committee, United States House of Representatives:

"Dear Sir:

"The du Pont Company desires to submit to the Ways and Means Committee, House of Representatives, and to other members of Congress, certain facts bearing on the manufacture of 'gunpowder and other explosives,' taxation on which is provided in H. R. 16763.

"We regret that we did not have an opportunity to be heard before this bill was framed, and refrained from requesting a hearing because we felt that any suggestion volunteered might be misconstrued. However, the proposed tax is of so vital interest to this company and the 60,000 men now in our employ that we feel justified in sending you this communication.

"1. This bill makes the du Pont Company and other manufacturers of explosives the subjects of double taxation—that is, it places a tax on net income and on gross receipts.

POINTS OUT DISCRIMINATION

"2. The bill discriminates against the manufacturers of explosives, singling out their industry for drastic treatment amounting to penalization, while others engaged in the manufacture of munitions of war and making equal or greater profits are permitted to go free. For example:

"From the beginning of the war, to and including April last, there were exported from the United States for military purposes:

"Auto trucks and passenger automobiles to the value of	$142,000,000
"Aeroplanes and parts	7,800,000
"Motorcycles	4,162,000
"Rubber, including automobile tires	41,800,000
"Woolen goods	70,000,000

NO GREAT PART OF EXPORTS

"Imposing as these figures are, they involve no great part of the nation's exports and a trifling part of its total profits attributable to the war. There could be added to the list such articles as canned meats, army rations of various kinds, shoes, harness, saddles, blankets, kerosene, gasoline, acids, alcohol, locomotives, parts of submarines, range-finders, stamped metal, military equipment, swords, bayonets, bromine and other military gases, barbed wire and other products of iron and steel.

"Indeed the list would include the products of almost every line of effort and industry. While we would not advocate a tax thereon, your attention is called to the fact that horses to the value of $128,872,000 and mules to the value of $31,186,000 have been exported for military purposes.

"3. The bill requires the payment of 8 per cent tax on large sales. This leaves a profit too small for the risks of explosive manufacturers. If 10 per cent is the maximum, no one can afford to take the risk of the minimum. This 10 per cent must be a maximum in many cases, if not in all, as all the profits above that amount are retained by the Government until a certain percentage of profits is reached, depending on the relation of sales to investment.

IF SALES ARE DOUBLE

"Thus if the sales of a corporation are double in value the manufacturing investment, 26 per cent must be earned before the company is allowed to retain more than 10 per cent. If the gross sales equal three times the value of the manufacturing plant, 34 per cent must be earned on capital invested in order to produce returns beyond the 10 per cent allowance of the bill.

"In other words, if the sales are double the plant value, the Government will receive 60 per cent of the total profits when the earnings are 26 per cent on the investment; and if the sales are three times the value of the investment the Government will receive 70 per cent of the profits if the investment yields 34 per cent, and in no case will the manufacturer receive more than 10 per cent on his investment.

"4. Why should 'gunpowder and other explosives' be singled out for discriminating, burdensome taxation even as compared with other materials classed as 'war munitions' on which the bill provides taxation? This is to say, why should a dollar received from gunpowder, or some other explosive, bear a tax of 8 per cent, while a dollar received from the gun that burns this gunpowder bears a tax of only 5 per cent, and the copper for shell cases but 3 per cent?

COPPER VALUE DOUBLED

"The value of the last named commodity (copper) has more than doubled since the outbreak of the war, with no material increase in the cost of production; whereas, the raw materials entering into 'gunpowder and other explosives' have advanced in some instances as much as 2,000 per cent.

"For example, short-fiber cotton has advanced from 2 cents to 8 cents per pound; toluol from 20 cents to $4.00 per gallon; benzol from 20 cents to 80 cents per gallon; fuming sulphuric acid from $15 to $150 per ton. Meanwhile there has been a constant reduction in the price of smokeless powder due to competition and market conditions; present prices having fallen below the level that obtained before the war. The maximum price reached at no time a 20 per cent advance over previous prices for foreign business.

"5. To make possible the production of explosives to meet the unusual demands, large sums have been invested in construction and equipment, the intrinsic value of which is maintained only in proportion to the use thereof. This represents capital invested largely from proceeds of munition sales and cannot be construed as legitimate taxable profits for reasons of depreciation of value as above noted. To the extent that future markets do not permit of the operation of these extensive plants, their intrinsic value is that of scrap only.

WOULD MEAN DISASTER

"6. The retroactive feature of this bill would ordinarily mean absolute disaster to the manufacturer of 'gunpowder and other explosives.'

"The foreign business that came to us was embraced in many orders representing 180 separate and distinct contracts. Most of these contracts have been completed, the money paid and distributed; some of it to stockholders, much of it being invested in other industries. Many of the stockholders who were the beneficiaries of this advance have disposed of their holdings.

"When these contracts were made, no such expense item as this was considered in fixing the price of our product. It is impossible now to distribute in any manner this additional burden, compelling the customer to bear his share, or forcing the original stockholder to assume his part.

"To force the stockholders of today to bear a tax amounting to possibly $20 or more per share of $100, which should have been visited on the stockholders of months ago, must impress anyone as inequitable and indefensible.

"Moreover we have no means of protection against this added burden in contracts which are now in force and which we are bound to carry out in the future.

"7. This tax, if imposed upon us, may prevent our taking further business of this character.

"This will mean the inevitable discharge of many employes from the service of the company. The total roll now aggregating approximately 60,000 must then be reduced to the five or six thousand necessary to operate the commercial business of the United States.

"We had expected to continue our maximum industrial activity as long as this war lasted, but the provisions of the pending bill make this an undesirable business risk.

"8. Guncotton, which is the chief ingredient entering into the manufacture of smokeless powder, and a material exceedingly sensitive as an explosive, will come within the classification of 'other explosives.' This tax on guncotton will prove burdensome to a number of important domestic industries to which it is essential in the products they manufacture.

HAVE ENJOYED PROSPERITY

"We admit that the manufacturers of 'gunpowder and other explosives' have enjoyed a period of exceptional prosperity during the past eighteen months, but that the net results accruing have justified Congress in placing upon them no such burden of taxation as is contemplated by this bill.

"While we have received what might appear as high prices for our products, we have been forced to meet unusual expenses. When this foreign crisis came, it found us with a military explosive capacity of approximately 10,000,000 pounds per annum. To meet the demands made upon us necessitated our multiplying this capacity many times, all preparation being made under pressure and regardless of cost.

"At the threshold of this undertaking, to insure harmony of action and attract labor, we advanced the wage scale to a standard never before known in the explosives industry. At the same time we gave notice of a 20 per cent bonus to all employes, and, in addition, placed every plant under our jurisdiction on the eight-hour basis. The unusual conditions compelled us to go to great expense, inclosing our plants in such a way as to protect them from destruction, illuminating adjoining territory and maintaining a guard system comparable only to a standing army.

PRICES WENT UP

"From the date of the first contract, we were forced to face an ever-ascending scale of prices on raw materials; nor were we ever permitted to forget the fact that when the war was over, the buildings erected and the machinery placed, representing millions of dollars, would stand for little or nothing in the way of value.

"We fear that many of the features noted above have not been taken into consideration before deciding to impose this tax. We have ever responded cheerfully to any taxation levied by our Government, but when such action is taken as threatens the destruction of our business, singling us out as specific objects of penalization, we feel that we are in duty bound to protest.

"In conclusion the manufacture of the particular military explosives which are likely to be taxed out of existence have contributed, probably more than any other industry, toward the revival of trade in this country.

"The du Pont Company alone has absorbed nearly 1,000,000 bales of short fiber cotton formerly of little value and has paid handsome prices therefor, greatly to the advantage of the Southern States. It has paid directly in wages alone in the manufacture of military explosives in the last year and a half about $45,000,000, and has probably been indirectly responsible for the expenditure of a greater amount to the labor on raw materials and machinery which it has puchased.

"It has contributed amazingly to income and corporation taxes, and the enormous expansion that has been made assures our Government a supply of smokeless powder and high explosives in case of war, which previously was never dreamed of. All this has been done without the Government contributing a dollar of expense.

"There can be no 'preparedness' without 'gunpowder and other explosives.' In a broad and liberal scheme of 'preparedness,' can Congress take chances on killing by taxation those industries without which there can be no 'preparedness?'

Very respectfully,
E. I. DU PONT DE NEMOURS & CO.,
P. S. du Pont, *President*."

Current Traffic Development

In case No. 6287 of the Poteau Coal and Mercantile Company *vs.* Abilene & Southern Railway Company, the complainant asks for the reinstatement of joint rates on coal from Witteville, Okla., to points in Texas and other States which had been canceled by the defendants, and for reparation. The defendants voluntarily restored the joint rates, but opposed the claims for reparation. At the hearing certain carriers asked the Commission to determine whether the Fort Smith, Poteau & Western Railway Company, which serves complainant's mine at Witteville, is a common carrier, and, if so, to fix divisions of the reinstated joint rates. Upon all the evidence, the Interstate Commerce Commission held:

1. The rates under attack were unreasonable in the amount that they exceeded the joint through rates formerly in effect and reparation awarded accordingly.

2. The Fort Smith, Poteau & Western Railway Company is a common carrier. The question of divisions left for further consideration.

The complaint in this proceeding was filed October 27, 1913, by a corporation then operating under lease a coal mine at Witteville, Okla.

Docket No. 7702.

In case No. 7702, the Galloway Coal Company *vs.* the Alabama Great Southern Railroad Company the Commission found that

1. Relative adjustment of carload rates on bituminous coal from mines in southern Illinois, western Kentucky, and northwestern Alabama to Memphis and other points in southwestern Tennessee not shown to be unduly prejudicial to mines in Northwestern Alabama.

2. Differentials in rates to common markets in favor of certain producing points can be prescribed only when discrimination can be found, and discrimination can be found only where the traffic from those points and from competing points moves all or a part of the way to the common markets over the rails of the same carrier.

MISS ROSE KOROUS.
In Charge of Welfare Work at Utah Plants of the American Smelting and Refining Co.

3. Relative adjustment of carload rates on coal from the same mines to Mississippi and Louisiana east of the Mississippi River found unduly prejudicial to mines in northwestern Alabama, but adjustment approved in Bituminous Coal to Mississippi Valley Territory, 39 I. C. C., 378, found remedial.

4. Long established rate adjustments that accord competing producing districts located at different distances from common markets equal rates will not be disrupted unless substantial justice requires it. The interests of consumers must be considered as well as the interests of producers, and dissatisfied producers deprived of the natural advantage of location must establish actual injury as a result of the discrimination.

5. Divisions of joint rates received by short lines in Mississippi on shipments of coal purchased by them for fuel not shown to be unduly prejudicial to mines in northwestern Alabama.

6. Relative adjustment of carload rates on coal from the same mines to points in southwestern Arkansas, Louisiana west of the Mississippi River and southeastern Texas not shown to be unduly prejudicial to mines in northwestern Alabama.

Latest Legal Decisions

SALE OF OIL WELL FOR TAXES

By the terms of an oil and gas lease the lessee was granted all the oil in and under the land described with the exclusive right to enter thereon for the purpose of drilling and operating for oil and gas, and if a well was not completed within sixty days then the grant should be null and void, unless the lessee should pay the lessor $1 per acre for each six months such completion is delayed. If the first well was a paying well, a second was to be drilled within sixty days from the completion of the first and all additional wells as the first two wells until all are drilled, allowing 15 acres to each well. This lease or contract conveyed an interest in the land, where the lessee had completed producing wells and the wells so drilled with the machinery attached must be considered real estate and not personal property and cannot be sold for taxes as personal property. This proposition is on the theory that while oil and gas leases differ from ordinary leases and usually give the lessee the right only to explore the land for oil and gas and until he finds either one or the other he has no interest in the land, but if the lessee found oil and gas then his so-called lease has ripened into an interest in the land.

Johnson *vs.* Sidney (Indiana Appeals), 109 Northeastern, 934, p. 935, October, 1915.

UNGUARDED EXCAVATION

A mining corporation is liable for the death of a 12-year-old boy who lost his life by falling into an old excavation on the property of the corporation, and in an action for damages for the death of the boy it is not necessary to prove that the defendant corporation or its officers had actual notice or knowledge of the existence of the excavation nor is it sufficient to avoid liability for the defendant to show that none of its officers had any actual knowledge of the existence of the hole; but the proximity of the excavation to a much traveled path and the knowledge of others in the vicinity of its existence, together with all the circumstances surrounding the situation, were sufficient to have a case submitted to the jury on the question whether the officers of the defendant corporation in the exercise of reasonable diligence ought not to have been aware of the excavation.

Peklenk *vs.* Isle Royale Copper Co. (Michigan), 153 Northwestern, 1068, p. 1069, September, 1915.

INSPECTION BY LAND OFFICERS

Where a register and receiver of a local land office have been ordered and directed by the Secretary of the Interior to examine and determine whether the land embraced within the boundaries of an unpatented mining claim is mineral or non-mineral, and whether or not a discovery of mineral bearing vein has been made with reference to lode and placer locations, and whether or not any such location has been made in good faith for mineral purposes or for speculative purposes and to be used in connection with trade and business, and where such register and receiver are proceeding to carry out such orders, a court has no jurisdiction to restrain such register and receiver from executing such orders of the Secretary of the Interior.

Cameron *vs.* Weedin, 226 Fed. 44.

POSSESSORY RIGHTS

The general land office is without jurisdiction to inspect and examine an unpatented mining claim, in the absence of an application for patent to determine whether the land embraced within the boundaries is mineral or nonmineral, or whether a discovery of a mineral bearing vein has been made, and whether or not the location has been made in good faith for mineral purposes.

Cameron *vs.* Woodin, 226 Fed. 44, p. 48.

NEGLIGENCE OF MINE FOREMAN

The bituminous mining act of Pennsylvania of 1911 places the management of the inner workings of the bituminous coal mines in the hands of a certified mine foreman and neither he nor his assistants whom he appoints are agents of the mining company and the company is not responsible for their acts unless it has notice that an emergency of danger has arisen demanding immediate action and that the mine foreman and his assistants are not discharging their duties with regard thereto; but the mining company is responsible if it has failed to comply with the orders of the mine foreman.

Vagaszki *vs.* Consolidated Coal Co., 225 Fed. 913, p. 915.

ASSUMPTION OF RISK

Under the bituminous mining act of Pennsylvania there can be no recovery for the death of a miner who was a man of mature age and of extended experience as a miner and had knowledge and appreciation of his danger and who knew that under the mining act he was required to quit work and vacate the place, where his working place was known to be unsafe, and where he knew of the presence of a dangerous rock in the roof that he could not himself remove, and where without assistance he resumed work and apparently undertook to take down the dangerous rock that caused his death, as in such case the conclusion is that he assumed the risk.

Vagaszki *vs.* Consolidated Coal Co., 225 Fed. 913, p. 922.

COLLUSIVE JURISDICTION

Citizens of California will not be permitted to organize a mining corporation in the State of Nevada and transfer to it the legal title to mining property in California for the purpose of conferring an apparent jurisdiction upon a federal court on the ground or diversity of citizenship, which would not otherwise exist.

Phoenix-Buttes Gold Min. Co., *vs.* Winstead, 226 Fed. 855, p. 861.

See Phoenix-Buttes Gold Min. Co. *vs.* Winstead, 226 Fed. 863.

ACTION FOR WRONGFUL DEATH

Where an action is brought in a United States court to recover damages for the death of a miner under the Pennsylvania State statute, the federal court will take judicial notice of the statutes and judicial opinions of that State and the federal court is bound by the construction given to such act by the courts of Pennsylvania.

Vagaszki *vs.* Consolidated Coal Co., 225 Fed. 913, p. 917.

APPLICATION OF RULE

Statutes which in terms abololish the doctrine of assumption of risk as a defense go no further than to abolish the defense where the servant is injured by reason of the employer's negligence, and do not abolish assumption of risk where the employer has not been negligent.

Hunter *vs.* Colfax Consolidated Coal Co. (Iowa), 154 Northwestern, 1037, p. 1043, November, 1915.

It is the duty of a mine operator to use all appliances readily obtained for the prevention of accidents arising from the accumulation of gas or other explosives and a failure on the part of the operator to observe that duty constitutes negligence on his part for which he is liable for an injury resulting proximately from such failure.

Raiha *vs.* Coos Bay Coal & Fuel Co. (Oregon), 151 Pacific. 471; September, 1915.

West Virginia Publication

There has just been published one of the most important volumes ever issued by the West Virginia Geological Survey, Morgantown, W. Va. This publication is described as follows:

Detailed report on Wyoming and McDowell Counties, by Ray V. Hennen, issued under date of December 31, 1915, containing 783 pages and introductory matter. It is illustrated with thirty-two halftone plates and twenty-eight figures or zinc etchings in the text. The soil map and report on the area will be issued separately a few months later. This Detailed County Report covers one of the principal areas of the great Pocahontas or "Smokeless" coal fields of West Virginia, giving a complete account of each coal bed, with analyses, estimates of unmined tonnage, and topographic and structural maps showing the elevation, dip and strike of the principal coal beds, including the famous No. 3 Pocahontas, covering the counties of Wyoming and McDowell, the latter leading every other county of West Virginia in the production of coal of the highest grade by several million tons annually. Price, with case of maps, delivery charges paid by the Survey, $2.50; but for combination price with other publications, see general circular of publications. Extra copies of geologic map, $1.00 each, and of the topographic map, 50 cents each.

ALASKANS CRITICIZE ACTION AS TO REVISION OF LAWS

No gloves were used by the Alaska Mining and Engineering Society in condemning the action of the House Committee on Mines and Mining in refusing to report out Senator Smoot's bill which had passed the Senate, providing for the Revision of Laws Commission. The Alaskan Society also adopted a resolution criticizing very severely the conduct of James Wickersham, the delegate from Alaska, for the part he took in defeating the Commission.

The Society in its resolutions declares itself to be convinced that the engineers who appeared before the House Committee are honest and sincere, and that the passage of the Smoot bill would result in great good not only for the entire country, but Alaska in particular.

The Democratic committee, of Alaska, in setting forth its intentions, goes on record as follows:

"The United States mining laws have not been changed since their inception, a generation ago, notwithstanding the fact that the mining industry of America has progressed wonderfully until the laws hedging it about have become obsolete. We favor a revision of the mining laws and we pledge our candidate for delegate to cooperate with those working to this end. Practically all the mining men of the country demand this legislation."

Says All Should Read It

Karl L. Kithil, just selected to take charge of the new mine experiment station at Tucson, referring to the MINING CONGRESS JOURNAL in a recent letter says:

"Your journal is of great value to the mining interests and industries, and should be read by all men interested therein."

William Loach, of Boulder, Colo., of the Wolf-Tongue Mining Co., was in Washington recently to attend a meeting of the directors of the company. The Wolf-Tongue is one of the largest tungsten producers in the United States.

B. Bryan, a petroleum and mining engineer of this city, has opened temporary offices at 120 Broadway, New York City.

COAL TAXATION SYSTEM IS UNFAIR AND ANTIQUATED, SAYS AUTHORITY

There would seem to be no recognized standard of value for coal content of lands at the present time, among the engineers and county authorities of Lackawanna or Luzerne Counties, Pa., and this lack of a recognized standard results in much confusion, litigation and expense, according to William Griffith, an engineer of standing, of Scranton, Pa. The commissioners of Lackawanna county have variously estimated the value of coal at from $55 to $300 per foot acre, and recently in Luzerne County one group of engineers employed by the landowners estimated the value of a certain tract of land at or around $700 per surface acre, while another group employed by the county authorities estimated the same land at about four times this value; thus indicating to the curious public that the judgment of experts on these questions is about as variable as the weathercock on the barn, being easily influenced one way or the other, according to the interests of the people who employ them. In discussing the matter, Mr. Griffith said:

"Recently a representative of one of our large coal mining companies testified in the Lackawanna County courts that his company considered the coal in the ground worth to them 50 cents per ton. And I presume that at the pending tax appeals other representatives of the same company will aver that the coal is not worth 25 cents a ton.

"All this indicates a sadly mixed state of affairs with reference to coal values, and it would seem that the adoption of some sane method of arriving at the standard of value would be proper at this time. In fact, the tendency, outside of the anthracite region, is in this direction. Not only have authoritative textbooks been written upon this subject, based upon sound principles of finance and engineering, but recently the Department of the Interior of the United States Government, through the Geological Survey, has established rules for fixing the value of the coal lands of the public domain, based upon such standards and principles, from which to estimate the value of each particular property, according to the varying conditions which obtain. The writer has used a similar basis of valuation for many properties that he has been called upon from time to time to value either for the purchaser or seller, or for financial interests to form the basis of value behind bond issues or other obligations, and has universally used the royalty rate as a proper standard of such valuation.

"The supreme courts have declared that a perpetual lease is a sale and that the royalties are installments on the purchase price. Therefore, the royalty represents the value of the coal in the ground, to be paid for as it is mined, and is a fair and equitable standard of value for estimating the worth of the coal; better to our mind than outright sales, because the sales of coal land in this locality are not frequent, and the deeds and records of such transactions usually cover up the actual selling price so that it cannot be ascertained. Of course, the royalties years ago were small—about 15 cents per ton. Later they increased to about 25 cents a ton for prepared coal. Still later about 35 cents was a going royalty, and at the present time it is from 50 cents to 75 cents; but the properties covered by high royalties of this kind are very few, and the tonnage contained is light, representing small comparative values.

"The real question, therefore, would be to definitely determine a proper, fair average royalty applicable throughout the county. Having fixed such for the county, or for any particular coal property in question, the present value of the coal in the land is a matter of nearly the same degree of certainty as we find expressed in the proposition that 2 times 2 are 4. Of course, each property becomes *a problem in itself, but having a basic standard, deductions or allowances may be made to conform to the various conditions and possibilities that may be peculiar to each property.*

"An illustration will perhaps best serve to explain the method of arriving at coal values from the royalty rate as a basis of calculation: If we have on the table before us 100 gold eagles, their value would be $10 each, or $1,000; but if a condition be attached to the possession by which the gold shall be deposited in the vault, and only one gold eagle, or $10 be used each year, then the present value is materially changed, and would be the present worth of $10 per annum, at say 6 per cent interest, for 100 years, which would be $166.17. Thus we note that the element of time affects the present value in a very material way. And the same would be the case in connection with coal. If, for example, we have a coal property which produces a royalty of $10 per year, and we know that the quantity of coal in the land is sufficient to continue this production for 100 years at the same rate, then the present worth of that coal would be $166.17. Again, Lackawanna County contains approximately 600,000,000 tons of coal, and it is being mined at the rate of 18,000,000 tons per year. At this rate it would be exhausted in approximately thirty-three years. If, for example, the average royalty rate for a composite ton (that is to say, a ton composed of the various percentages of different sizes ordinarily produced at the breakers) be assumed at 25 cents, the present value of one such ton per year for thirty-three years (that is, 33 tons), at legal interest, 6 per cent, would be $3.5575, and the present value of 1 ton of coal in the ground, on the above basis would, therefore, be $3.5575 divided by 33 or about 10.8 cents. At the various royalties mentioned below the values would be according to the following tabulation:

Average royalty rate for composite ton	*Present value of 1 ton of coal in ground*
25 cents per ton	10.8 cents per ton
30 cents per ton	12.9 cents per ton
35 cents per ton	15 cents per ton
40 cents per ton	17 cents per ton

"If it is desired to express this in foot-acres, we simply multiply the above value per ton by the number of available tons in 1 foot-acre. If, for example, we assume that a fair and reasonable yield for the coal lands of this county is 1,200 tons per foot-acre, then, at the above royalty rates, the present value of the average foot-acre in this county would be as follows:

At 25 cents per ton royalty.....	$130
At 30 cents per ton royalty.....	155
At 35 cents per ton royalty.....	180
At 40 cents per ton royalty.....	204

"It would seem to us that a fair and reasonable royalty as between land owner and taxing authorities should be somewhere around 30 cents to 32 cents per ton for the average composite ton, because the major portion of the coal now being operated under royalty is being paid for at approximately this price.

"Then, of course, the question arises as to whether it would be more equitable as between all parties to value the coal at the actual rate which is now being paid for it, or whether it should be valued at a higher rate, in view of the increased royalties now being paid on new leases. These are questions to be determined but having them once settled for each county, there would then be a standard which would be a basis upon which the value of all properties could be estimated, *these values of course varying according to the economic conditions known to exist on the several properties.*

"It will be noted that this method of ascertaining the taxable value of coal places the greater burden of the tax upon the coal in the going properties, which will be sooner exhausted. For example, at the royalty rate of 30 cents per ton, other things being equal, the coal in a property which will be exhausted in ten years, would have a present value of 22 cents per ton, whereas at the same royalty rate the coal in an adjoining property which had a life of sixty years would have a present value of 8.1 cents per ton. To our mind, this is as it should be, because it is manifestly unfair to tax the unremunerative ton year after year at full rate for sixty or 100 years, whereas the remunerative ton of coal which is mined this year escapes with but the one tax. And along the same line, virgin properties which are held for future mining, should, to our mind, be considered in the same manner as we now treat unremunerative, unseated lands, by imposing a *sufficient* nominal tax until such time as they become productive. For purposes of conservation, the forestry associations have for years been endeavoring to secure the removal of the tax upon standing timber, until such time as it is cut. They have now realized the fruits of their long efforts through the passage of such a law by the legislature. The same legislation should be enacted to cover the anthracite coal in the ground. It should only be taxed in a nominal way until it is mined. Each ton should be taxed once and once only. Perhaps the better way to accomplish this would be to eliminate the taxation of coal as real estate, except in a nominal way, and lay a tax upon each ton of coal as it is mined, as is being advocated by the Scranton Board of Trade.

"Although these latter suggestions cannot be applied through our present antiquated and unfair laws in the taxation of coal, and are somewhat aside from our subject, they are nevertheless important matters for immediate legislation, which should be vigorously pressed."

UTAH COPPER COMPANY BREAKS PRODUCTION RECORD

By A. G. Mackenzie

Salt Lake City, July 27.—The Utah Copper Company of Bingham, Utah, has broken its production record several times recently. The company mined and shipped to the mills 44,000 tons of ore July 9, and has plans under way for increasing the plant to handle 50,000 tons a day. A leaching plant with an initial capacity of 2,500 tons a day is included in the plans for enlargement and is expected to be in operation by the end of the present year.

APPERSON ELECTED GOVERNOR

A. B. Apperson, vice-president of the United States Fuel Company, Salt Lake City, was elected governor of the Utah chapter, American Mining Congress, at a meeting of directors, July 5, to succeed R. C. Gemmell, general manager of the Utah Copper Company. Mr. Gemmell served the chapter as governor very efficiently for a year and resigned on account of the press of business in connection with his company's extensive construction campaign for the coming year.

Geo. H. Dern, of Salt Lake City, a former vice-president of the American Mining Congress, was elected second vice-governor of the Utah chapter to succeed E. L. Carpenter who has moved to New York.

Mr. Apperson, the new governor of the chapter, has had an active career in executive positions with important mining and railroad interests of the West for many years.

Falcon Joslin, of Seattle and New York, who has been spending some little time in Alaska looking after his interests in the Territory, is now at his home in Seattle.

Latest Mining Patents

Means for sampling and Checking Miners' Coal. No. 1,191,277. This invention is by Erskine Ramsey, of Birmingham, Ala.

It relates to means for sampling and checking miners' coal or other mineral output so that an accurate record can be kept of the character and quality of the mineral loaded by each miner, which record will serve as a check on the mineral loaded into a given railroad car or like container, and also to indicate to the operator the character of his total output and what parts of his mine are producing an inferior grade of mineral, or showing bad results so that he can change his operations at such points.

Safety Apparatus for Oil Wells. No. 1,191,229. This invention is by Robert H. Reed, of New Wilson, Okla., assignor of one-half to J. L. Long, of New Wilson, Okla.

It relates to certain novel and useful improvements in an apparatus adapted especially for use in controlling the escape of gas from the tank into which the oil flows from a source of supply such as a well. In this invention it is proposed to provide an apparatus to prevent disastrous explosions and fires, caused by lightning or through other agencies.

Ore-Classifying Machines. No. 1,191,280. This invention is by Selden Irwin Clawson, of Salt Lake City, Utah.

The invention relates to ore classifying machines, and more particularly to that class of machines in which a series of inclined screens are arranged in a zig-zag manner, over which the ore to be classified travels, the object being to provide a machine which is very strong and durable, and one in which partitions are set at right angles to the axis of the screen so that the ore is caused to travel over the screens a great number of times, thereby increasing the screening capacity.

Another object is to provide a screen and pan with a plurality of alternately arranged partitions for retarding the movement of the material over the screen, whereby the material will be thoroughly classified as it travels over it.

Expanded Graphite. No. 1,191,383. This invention is by Jonas W. Aylsworth, of East Orange, N. J., assignor to Condensite Company of America, of Bloomfield, N. J.

This invention relates to a novel form of graphite and to a process for making it. This invention changes the physical condition of flake graphite so that after the treatment it is greatly expanded in volume with all of the many small leaves or laminae of which each flake is composed opened up and separated like the leaves of an open or partly opened book without being completely detached from each other.

Rock and Ore Breaker. No. 1,191,564. This invention is by Thomas W. Capen, of Milwaukee, Wis., assignor by Mesne Assignments to Allis-Chalmers Manufacturing Company, a corporation of Delaware.

This invention relates to rock and ore breakers or crushers and has for its object the breaking of rock and ore with greater facility than heretofore and the production of a breaker of great capacity. A further and incidental object is the production of a double breaker in which the two breaking elements of each kind are so opposed as to mutually react to prevent the reaction of the breaking pressure from acting through or across the bearing surface at least in certain directions.

Rock Drill. No. 1,191,842. This invention is by William August Smith, of Denver, Colo., assignor of one-half to William W. Hassell, of Colorado Springs, Colo.

This invention relates to certain new and useful improvements in rock drills, and the object thereof is to provide an improved and novel construction of rock drill.

BIG INCREASE IN COPPER SHIPMENTS FROM ALASKA

Alaska during the fiscal year ending June 30, 1916 shipped to the United States copper, valued at $26,488,000. This compares with shipments valued at $5,132,000 in 1915 and $3,876,000 in 1914. Antimony to the value of $189,000 was shipped during the last fiscal year. Practically no antimony was shipped in previous years. Tin shipments were valued at $79,000. This is not a great increase over the shipments of 1915 and 1914. Lead shipments from Alaska for the same period of 1915 and 1916 are valued at $72,000.

Shipment of gold from Alaska during the fiscal year amounted to $16,200,000. This was an increase of $1,000,000 over 1915 and an increase of more than $4,000,000 over 1914. Silver shipments were valued at $760,000 for the fiscal year ending June 30, 1916. This is an increase of $500,000 over 1915 and $600,000 over 1914.

Permissible Explosives Lower Death Rate

In 1914 over 15,000,000 pounds of permissible explosives were used and the fatality rate dropped to .096 per 1,000 men employed. A reduction of 72 per cent. In 1870 there were 13.47 fatal accidents for every million tons of coal mined in this country and in 1914 only 4.78 for every million tons mined.

Current Federal Legislation

During the present session of Congress 23,896 bills have been introduced. Of this number 17,185 were introduced in the House and 6,711 were introduced in the Senate.

In a caucus held by the majority members in the Senate in July it was decided to adjourn August 19 if possible. An informal agreement was made with the minority members wherein they promised not to filibuster against the bills which had been placed on the Democratic program. Republican members, however, reserved the right to discuss fully any measure which should come up.

It already is very evident that it will be impossible for the Senate to finish its work on the date specified by the Democrats. It certainly will be September 1 before the session adjourns, and there are some of the impression that it will be nearer October 1.

For the past three weeks the House has been marking time. While there are a large number of very important bills before the House Committees, they are not being acted upon owing to the refusal of the House leaders to contribute to the further congestion of the Senate calendar. The Senate already has many times more bills than it possibly can consider. For this reason the House leaders are refusing to allow any further bills to be acted upon in the House, thereby adding to the amount of work before the Senate.

By unanimous consent of all the members of the Committee on Mines and Mining no effort will be made to consider the Foster bill or other form of mining law legislation at this session of Congress.

Letters have poured into the office of Dr. Foster and of other members of the committee in great volume. Such diverging views are shown by these communications as to make it clear to even the more ardent supporters of Dr. Foster's bill that the question of revising the mining code must go over until the short session, at least.

Representative Taylor, of Colorado, who is the leader on the committee in favor of the appointment of a commission to study the needs for changes in the mining law, sees in this difference of opinion a splendid argument in favor of his plans for a general study of conditions by a commission before attempting to formulate a bill.

The sub-committee which listened to the arguments and perused the correspondence against the tax on copper was composed of Senators Stone, of Missouri; Thomas, of Colorado; and Hughes, of New Jersey.

The income tax portion of the bill, which also had a direct bearing on mining companies, was considered by a sub-committee consisting of Senators Williams, of Mississippi; James, of Kentucky; and Gore, of Oklahoma.

The Tariff Commission and dumping features of the bill were considered by a sub-committee consisting of Senators Johnson, of Maine; Smith, of Georgia; and Kern, of Indiana.

The Senate has agreed to take up the oil land leasing bill on the second Monday in December. A hard fight was made by Senators Phelan, of California; and Myers of Montana; to get this bill before the Senate at this session.

Due to the fact that very determined opposition is certain to be encountered in the consideration of this bill the Democratic Senators were unwilling to put it on their program. All efforts are being directed to shorten the session as much as possible. For this reason this bill and a large number of other measures will not be considered further at this session. The Senate calendar is in a very congested state and plenty of work already is banked up for the short session which begins in December.

H. R. 12544. After reporting favorably this bill, which deals with the mining of coal on segregated Indian lands in Oklahoma, it was placed upon the House calendar. Representative Carter, the chairman of the House Committee on Indian Affairs, has been very active in an attempt to get this bill before the House. He has called attention a number of times to the fact that it is not alone a benefit to the operators of mines in that section, but to the Indians and the general public in Oklahoma. Despite his efforts, however, the chances are slight that it will be considered at this session.

A full discussion of the revenue bill, which is now before the Senate, will be found on another page.

Added to Permissible List

Explosives placed on the Bureau of Mines permissible list recently are:

Big Red No. 2, Big Red No. 4-L. F.; Little Red No. 2, Little Red No. 3 and Little Red No. 6-L. F.; made by the Equitable Powder Manufacturing Co., East Alton, Ill., and the Egyptian Powder Co., East Alton, Ill.; Miners Friend No. 7 made by the Atlas Powder Co., Wilmington, Del., also was approved.

J. B. Ross, a prominent tungsten miner of Boulder, Colo., has returned to his home after a visit in the East. Mr. Ross is interested in several companies mining tungsten deposits, and also is the principal shipper of huebernite from Silverton, Colo.

David Atkins, of Atkins-Kroll & Co., of St. Louis, has been in the East on an extended business trip. The Atkins-Kroll Co. is among the largest dealers in rare metals. The company formerly operated sheelite mines and recently has been operating tungsten properties at several points in Nevada. The company also has a large mill at Borus, near Sodaville.

Ralph H. Richards, a petroleum engineer with the Associated Geologists of this city, has returned from an extended trip in the mid-continental field.

King H. Young, of Michigan, has been appointed private secretary to Van H. Manning, director of the Bureau of Mines.

T. W. Woodbridge, of Uplands, Cal., was in the city recently consulting with Van H. Manning, director of the Bureau of Mines.

Van H. Manning, director of the Bureau of Mines, is in the West making preliminary arrangements for the establishment of the new experiment stations.

Franklin K. Lane, Secretary of the Interior, was guest of honor at a lunch given by the chiefs and assistant chiefs of the different bureaus of the Interior Department Bureau of Mines building, July 15. It was in honor of the fifty-second anniversary of Mr. Lane's birthday.

Frederick G. Clapp, of The Associated Geological Engineers, left July 13 for Wyoming. He will visit certain Kansas and Oklahoma fields also before his return to New York.

DENVER QUARTZ MILLS

AND DENVER STEEL CRUSHERS

have that kind of reliability that constantly and continuously keeps on being reliable.

The Denver Quartz Mill & Crusher Co.
216-17 Colorado Bldg., Denver, Colo., U.S.A.

Thorne, Neale & Company
Incorporated
601-610 Stephen Girard Building, Philadelphia, Penna.

Temple Collieries—**Harry E.**, L. V.; **Forty Fort**, L. V.; **Mount Lookout**, L. V. or D., L. & W.; **Lackawanna**, D., L. & W. or Erie.

Schuylkill Collieries—**Buck Run**, P. & R.; **New Castle**, P. R. R.

ANTHRACITE
AND
BITUMINOUS
COALS

Agents for
Pardee Bros. & Co.
Lattimer-Lehigh

Bituminous—**Sonman Shaft, "B" Vein; Sonman Slope, "E" Vein.**

Sonman Smithing—1½-inch Screened, Low Sulphur, Spongy Coke
SHIPMENTS—RAIL OR WATER

CHAS. E. FERNBERG, *General Sales Agent*
New York Office: 17 Battery Place
Baltimore Boston Chicago Buffalo Mauch Chunk
Cable Address: "THORNEALE"

THE MINING CONGRESS JOURNAL

SAFETY—EFFICIENCY—CONSERVATION

VOL. II
SEPTEMBER, 1916
No. 9

Dr. Philip S. Smith
Administrative Geologist, U. S. Geological Survey

PUBLISHED BY
THE AMERICAN MINING CONGRESS
PUBLICATION OFFICE
MUNSEY BUILDING WASHINGTON, D. C.

$ 2.00 PER YEAR
20 ¢ PER COPY

The best rubber belt we have ever used

These are the words of an Ohio Superintendent using

COMMANDER
DRIVE BELT

It is the best Rubber Belt that we have ever used. We have tried out a great many different kinds and none of them come close to equaling the service received from "Commander".

Practically all of our difficult drives have been equipped with it, and on most of them we have tried many kinds of belting, without any comparable degree of service.

We are very much enthused with it, and are glad to recommend it where there is a demand for a belt for hard service.

Very truly yours,

Supt.

Best for hard service

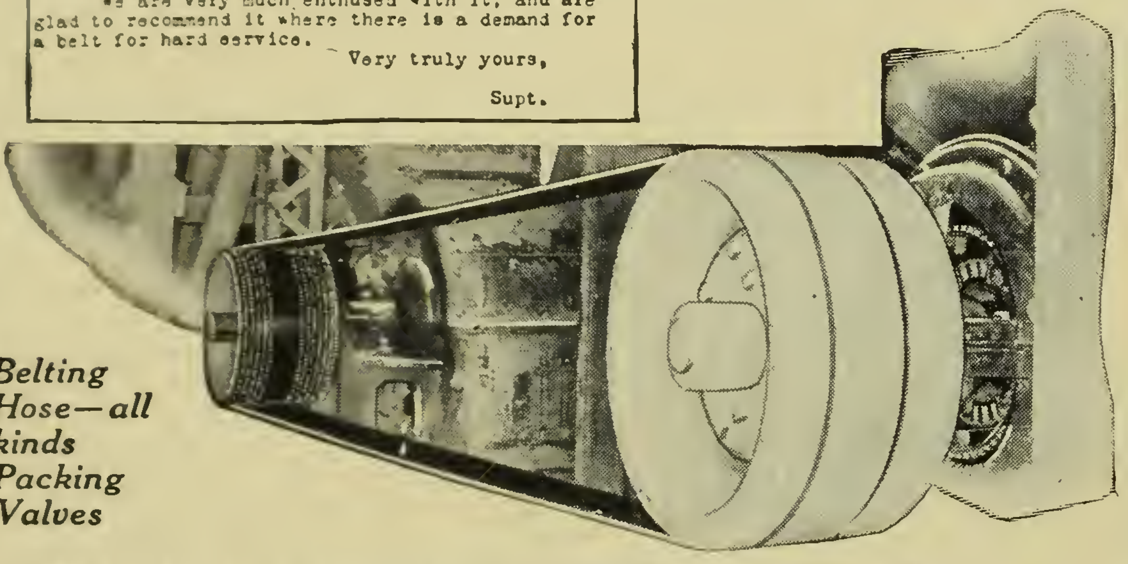
It takes a "Commander" belt (Commander in deed more than in name) to overcome obstinate drive conditions with a degree of satisfaction termed best by the operator.

There is only one "Commander" a marked leader that commends the admiration of the user.

That accomplishes its hardest task with lower operating costs.
That overcomes objectionable shutdowns.
That creates a new standard of volume in production

and *that* "Commander" is positively the best belt that Goodrich with its 47 years of experience can make.

Specify Commander and test its true worth.



Belting
Hose—all kinds
Packing
Valves

THE B. F. GOODRICH COMPANY **Factories: AKRON, OHIO**

Makers of the Celebrated Goodrich Automobile Tires—*"Best in the Long Run"* Branches and Distributors in All Districts

---

SUSQUEHANNA COAL CO.

MINERS AND SHIPPERS

SUPERIOR ANTHRACITE

GENERAL OFFICE:
907 COMMERCIAL TRUST BUILDING
PHILADELPHIA, PA.

Sales Offices:

NEW YORK	No. 120 Broadway
PHILADELPHIA	1436 Commercial Trust Bldg.
CHICAGO	1305 Old Colony Bldg.
ERIE, PA.	210 Marine Bank Bldg.
BALTIMORE	100 Chamber of Commerce Bldg.
WILLIAMSPORT, PA.	1, 2 & 3 Hart Building

VOL. 2, NO. 9 WASHINGTON SEPTEMBER, 1916

THE MINING CONGRESS JOURNAL

Official Organ of the American Mining Congress

SENATE STRIKES OUT TAX ON COPPER; REFUSES TO RAISE MONEY FROM RAW MATERIALS

Proposal to Raise Revenue from All Metals Entering into Manufacture of Munitions Meets Favor of Committee But is Stricken Out of Bill on Floor of Senate —House Expected to Recede in Conference.

By eliminating the tax on copper from the revenue bill the Senate followed the course urged upon it by members from the metal producing states. At first the most favorable action expected was the reduction of tax on the one metal by making it apply to all metals entering into the manufacture of munitions of war but concerted action and clear reasoning finally secured the removal from the bill of any tax on raw materials.

There are some very ardent supporters of the copper tax idea in the House and there is certain to be a determined effort to restore it to the bill in conference. That such an effort will be futile is quite evident by the overwhelming sentiment in the Senate against placing a tax on raw materials and the divided support given the proposition in the House. The fact that cotton forms an important raw material entering into the manufacture of explosives aligns southern members with those from the metal producing states in their opposition to the original House bill or to the proposal to spread a tax over all the metals entering into the munitions trade.

CHANGED IN SENATE

With regard to the tax on munitions the House Committee on Ways and Means said:

"Because of exceptional circumstances your committee is of the opinion that a special tax should be levied upon the manufacture of munitions, and that the same can be done without imposing an unjust or unreasonable burden."

In commenting on this feature of the bill the Senate Committee on Finance stated in its majority report:

"It is estimated that the bill as it came from the House would raise $197,000,000 and as amended by the Senate would raise $205,000,000.

"This difference results largely from the reductions made in the bill as reported by your committee in changing the House method of taxing munitions, and the elimination of the copper tax provided for in the House bill, substituting therefor a 5 per cent profit tax upon materials entering into the manufacture of munitions, by adding certain additional classifications to the income tax and inheritance taxes as carried in the House bill.

"The House bill imposed a tax upon the manufacture of munitions, upon the basis of a graduated percentage of the gross receipts of all such persons and corporations. It also imposes a tax upon the gross receipts from the manufacture or sale of copper, brass, and other alloys, whether used in the manufacture of munitions or not. It did not provide for the payment of a tax by a subsidiary manufacturer or subcontractor. Your committee thought it just that subcontractors as well as contractors should pay whatever tax was imposed by this title.

"After due consideration your committee reached the conclusion that a net-profit tax would be a more just and equitable method of taxation than a gross-receipt tax, as proposed in the House bill. They have therefore amended the bill so as to provide for a tax to be levied upon the basis of net profits.

"Your committee also recommends that the bill be so amended as to eliminate the tax imposed upon copper, and as a substitute for that portion of the bill they recommend a tax upon corporations selling or manufacturing materials actually entering into and used in the manufacture of munitions as specified in the bill. Your committee believes that there should be a difference between the rate of tax imposed upon a finished munitions and upon the materials used and entering into its manufacture and they therefore recommend that the tax upon munitions be fixed at 10 per cent and that upon materials at 5 per cent of the net profits. Your committee further amends the House bill by confining this tax to corporations manufacturing munitions and corporations manufacturing or selling materials for use in the manufacture of munitions."

ALLOWANCE FOR DEPLETION

The provision of the bill allowing for depletion passed the Senate in the following form. The chances favor its acceptance by the House conferees:

Eighth. (a) In the case of oil and gas wells a reasonable allowance for actual reduction in flow and production to be ascertained not by the flush flow, but by the settled production or regular flow under rules and regulations to be prescribed by the Secretary of the Treasury; (b) in the case of mines a reasonable allowance for depletion thereof not to exceed the market value in the mine of the product thereof, which has been mined and sold during the year for which the return and computation are made; (c) and in the case of timber a reasonable allowance for stumpage not in excess of the market value of the standing timber actually sawed and sold during the year for which such return and computation are made: *Provided,* That no deduction shall be allowed for any amount paid out for new buildings, permanent improvements, or betterments, made to increase the value of any property or estate, and no deduction shall be made for any amount of expense of restoring property or making good the exhaustion thereof for which an allowance is or has been made.

THE HOUSE PROVISION

The provision in the House bill which included the tax on copper reads as follows:

Sec. 201. That every person manufacturing gun powder or other explosives shall pay for each taxable year an excise tax equivalent to the following percentages of the gross receipts during such year from the sale or disposition of such explosives manufactured in the United States, except blasting powder and dynamite:

Five per centum of the amount of such receipts not in excess of $1,000,000, and

Eight per centum of the amount by which such receipts exceed $1,000,000.

Every person manufacturing (a) cartridges, loaded or unloaded, caps or primers; or (b) projectiles, shells, or torpedoes of any kind, including shrapnel, loaded or unloaded or fuses; or (c) firearms of any kind, including small arms, cannons, machine guns, rifles, and bayonets; or (d) any parts of any of the articles mentioned in (a), (b), or (c), shall pay for each taxable year an excise tax equivalent to the following percentages of the gross receipts during such year from the sale or disposition of any such articles manufactured in the United States:

Two per centum of the amount of such receipts not in excess of $250,000;

Three per centum of the amount by which such receipts exceed $250,000 and do not exceed $500,000;

Four per centum of the amount by which such receipts exceed $5000,000 and do not exceed $1,000,000; and

Five per centum of the amount by which such receipts exceed $1,000,000.

Every person smelting copper ore or copper concentrates, refining metallic copper, or alloying copper, shall pay for each taxable year an excise tax equivalent to the following percentages of the gross receipts during such year from the sale or disposition of refined copper or copper alloys and from the sale or disposition of crude or unrefined copper if sold or disposed of for any purpose except for refining or alloying:

One per centum of the amount by which such receipts exceed $25,000 and do not exceed $1,000,000;

Two per centum of the amount by which such receipts exceed $1,000,000 and do not exceed $10,000,000; and

Three per centum of the amount by which such receipts exceed $10,000,000.

CHANGED IN SENATE

This was changed by the Senate Committee to read as follows:

Sec. 41. (1) That every corporation manufacturing (a) gunpowder and other explosives; (b) cartridges, loaded and unloaded, caps or primers; (c) projecties, shells, or torpedoes of any kind, including shrapnel, loaded or unloaded, or fuses, or complete rounds of ammunition; (d) firearms of any kind and appendages, including small arms, cannon, machine guns, rifles, and bayonets; (e) electric motor boats, submarine or submersible vessels or boats; (f) any part of any of the articles mentioned in (b), (c), (d), or (e); shall pay for each taxable year an excise tax of 10 per centum upon its entire net profits actually received or accrued for said year from the sale or disposition of such articles manufactured within the United States.

(2) And every corporation selling to or manufacturing for any corporation mentioned in paragraph (1) any material entering into and used as a component part in the manufacture of any of the articles enumerated in (a), (b), (c), (d), (e), or (f), shall pay for each taxable year an excise tax of 5 per centum upon its net profits actually received or accrued for said year from the sale or disposition of such material so entering into or used as a component part in the manufacture in the United States of the articles so enumerated as aforesaid.

ASHURST'S AMENDMENT CARRIED

On motion by Senator Ashurst, of Arizona, paragraph two was stricken out.

Senator Warren, of Wyoming, thinks the miners will have to pay the tax assessed against munitions anyway as he anticipates that means will be found whereby the tax can be shunted back onto the mine operators.

This view is not shared by the Democratic Senators from the metal producing states. They are very much pleased at the victory they won in the interest of the mining industry.

The only other important changes that were made in the paragraphs quoted above were: the exception of explosives and munitions used for industrial and sporting purposes and the addition of a proviso "That no such corporation shall be subjected to taxation upon net profits received during 1916 from the sale and delivery of articles under contract executed and solely performed prior to January 1, 1916.

OPPOSES UNEQUAL TAX

Senator Stone, of Missouri, chairman of the sub-committee handling the munitions schedule of the bill, spoke in part as follows in introducing the schedule:

"When the Underwood bill was pending before the Finance Committee and before the conference committee, whether right or wrong, I took the position that lead and zinc were not treated in the metal schedule of the bill in a way that put those metals upon a basis of equality, as a matter of fair treatment, with other metals.

"My view at that time—and it still is my view—was that in making a tariff bill and fixing rates of duty on items in a schedule there should be, as far as practicable, a basis of fair dealing or equality—and equality is fair dealing—as to all the items in that schedule.

"If I thought, as I did think, that steel or other metals were given better treatment in the schedule than lead or zinc, I had a right to insist upon such adjustment of the rates as would eventuate in a nearer approach to what I considered substantial equality; and that is exactly what I did, and all I did.

"Here is what occurred so far as this bill is concerned. In this bill as it came to us from the House there was a tax levied upon copper and its products, but not in like manner on other similar metals. The subcommittee, made up of the Senator from New Jersey (Mr. Hughes), the Senator from Colorado (Mr. Thomas), and myself, all reside in States producing other metals of like kind and used for like purposes. There is no copper produced in the State of Missouri, and only in a small way, as I understand, in New Jersey, and comparatively in a small way in Colorado; but great quantities of zinc are produced in all three of these States, and great quantities of lead are produced in both Missouri and Colorado. There was not a dissenting voice in the subcommittee to the proposition that if copper was to be taxed in the bill, the other metals should go along with copper and bear the same burden. Lead and zinc were not in the bill as it came from the House. I did not try to keep them out, but, on the contrary, I insisted upon putting them in."

MYERS PROTESTS

Senator Myers, of Montana, vigorously opposed any tax on raw materials. Addressing the Senate he said:

"There should be no tax in this bill on raw material unless all raw materials which are now and have been for some time enjoying an unusual degree of prosperity are taxed all alike. I do not believe it is just to single out a product of the metal-producing States and put a tax on metals when there are many other raw products enjoying just as great or greater prosperity which go untaxed.

"A tax on metals is peculiarly a tax on development, industry, and exploration of the western country. It strikes with peculiar force the far Western States—the metal-producing States of the Union. It would have very much of a tendency to discourage prospectors from going out and discovering new bodies of ore, and getting capital for their development, and opening up new mines for the benefit of the entire country. It would have a very strong tendency to discourage the operation and development of many small mines which have scarcely reached the productive point or have no more than reached that point. It would be very strongly resented by the people of the mining States. The mining business is a hazardous business. It is extremely sensitive, and capital and labor are very easily turned away from it.

"As far as copper is concerned, copper is and has been for a great many years on the free list. It enjoys no protection; probably it is in no particular need of any. At least, it is not asking for any. We are not asking any for it. I think for forty years or more copper has been on the free list; and yet there is a great deal of copper produced in Mexico in normal times, and some of it is shipped into this country and competes with the products of our own copper mines. We ask no protection on copper. I would be the last person in this body to ask for that; but when it is on the free list, and has to compete with the copper mines of Mexico, where labor is cheaper than here, to say that its production should be penalized by having the heavy hand of a tax laid upon it, and laid upon all copper produced in this country, I think, under the circumstances, would be unreasonable and unfair. Only recently has copper been enjoying some prosperity. Eighteen months ago copper was being produced in Montana at a loss, or was barely paying the cost of production.

"Under the present tariff law the duty on lead and zinc is very much reduced, as compared with what it was a few years ago. We are not making any complaint of that. We are satisfied. But to go further and lay the heavy hand of a penalty in the way of a tax on producing those metals in this country, I think, would be unfair; especially unfair to that group of States which constitute the metal-producing States of the Union, and which contribute in that line of production very largely to the common welfare and prosperity of all the States in the country."

PENROSE REPLIES

Senator Myers' observations brought forth a sharp rejoinder from Senator Penrose, of Pennsylvania. He said:

"I can appreciate the gladness of the Senator from Montana (Mr. Myers) in having this paragraph stricken from the bill. The majority—and he belongs to it—went merrily along so long as direct taxation was confined to individuals and corporations largely in New York, Pennsylvania, and half a dozen Northern States, and the tax on munitions was all right from his point of view as long as it was confined to the higher manufactories chiefly located in Connecticut or in Pennsylvania. But the very moment direct taxes were imposed upon the component parts of munitions, which affected copper and zinc in his own State, and zinc and lead in Missouri, and cotton in the Southern States, we find that their heroic stand for raising revenue fades away, and the spasm of virtue which they had in their caucus, when they inserted this paragraph, disappears here on the floor of the Senate."

AS TO OIL WELLS

An interesting discussion having a bearing on the method of taxation as applied to oil wells and coal and metal mines was precipitated when Senator Phelan, of California, read the following telegram from the Independent Oil Producers' Agency, which is made up of 176 companies:

The committee amendment, Senate Calendar No. 722, H. R. 16763, fixes deduction for depletion of oil wells as a reasonable allowance for actual reduction in settled production. This will deny depletion to all oil-producing companies that maintain their production by new developments and new capital. We beg of you to use every effort immediately to secure for oil companies depletion on same basis as proposed for mines, being a reasonable amount annually, not to exceed the market value of oil in the ground, of the product which has been brought to the surface. Present amendment causes oil producers to pay tax on capital and not upon income. All oil producers in California deeply interested.

Commenting on the message, Senator Phelan said:

"If it is true that it forces producers to pay taxes on capital and not upon income, I am sure the committee will meet the objection. As I understand, it seems that an income tax is charged upon the production value of the product, to be ascertained not by the flush flow but by the settled production or regular flow. These gentlemen, in order to meet the constant diminution of their product sink new wells and invest new capital so that when the collector comes around there will be no deduction whatever for depletion, because they have made it good by the investment of new capital. I should like to submit that to the committee, and ask that immediate action be not taken until a little later, in order that it may be studied. As I have said, the telegram has just been received."

WILLIAMS EXPLAINS

Senator Williams, of Mississippi, in charge of the bill, said, in reply:

"In answer to what was said by the Senator from California, the committee does not think that this will result in taxing any part of the capital as income. Of course, we had to fix a rule, and the rule cannot work with mathematical precision in the case of things which differ so much from one another as oil wells do. Under the present law, Mr. President, they are allowed to deduct only 5 per cent of the gross value of the product in the place of output. We thought that that deduction was too little and that there ought to be a deduction more equitable in its character.

"There has been no part of the bill which has been more anxiously studied and which presented more difficulties than this part of it. After consulting those in the Senate who were most familiar with the operation of oil wells we finally adopted this provision, which was presented by the Senator from West Virginia (Mr. Chilton), who is thoroughly acquainted with the business. On the one side was the House bill and the present law, which allowed a deduction of only 5 per cent. Upon the other side was the danger that a deduction of the entire flush product of the well might be made, and as a consequence no taxes paid at all.

"If the Senator will notice the bill, he will see that we have adopted a different rule for metallic mines and for coal mines, for the very reason that I have stated. The Senate committee undertook to try to fix a rule that would be just in each case. Of course you can tell the value of the coal in the ground, because coal is coal; but you cannot tell the value of copper in the ground, nor the value of gold, nor the value of silver, because the ore when it comes out is neither gold nor silver nor copper; it is mixed with various other things. So we kept the old 5 per cent provision with regard to them, and then we made a new rule as to gas and oil, and then we made a new rule as to coal, and then we changed the rule with regard to metallic mines by hedging it around so that the department could not, by ruling, do what it has done."

Senator Phelan then asked:

"Do I understand, then, that there is no rule, and that the department is to ascertain the value of copper and gold and silver buried in the ground in order to determine the amount of income tax?"

POINTS OUT DIFFERENCE

Senator Thomas, of Colorado, answered the query as follows:

"The only difference is a difference of process. The assay determines the metalliferous contents of metallic ore, while, of course, coal is a commodity all of which in the vein is a commercial product. It is therefore merely a difference in the method of ascertaining the value. The output of a copper mine or of a lead mine for 12 months yields certain metalliferous contents, and the value in the mine of these contents is thus easily ascertainable. I will say to the Senator from California that the principle is one which occurs very commonly in his state and mine as a result of trespasses by one mine owner upon the property of another, sometimes willful and sometimes unintentional. Where it is unintentional the damages are based upon the value of the ore in the mine; and that is ascertainable, as I say, by assaying the contents and ascertaining them by chemical analysis. It is a perfectly simple and perfectly easy method of procedure."

Senator Chilton, of West Virginia, who is well informed with respect to the oil industry, made this explanation:

"The old law, making a deduction of not exceeding 5 per cent, after it was explained to the committee, of course, struck the committee as being absolutely an arbitrary one, and based upon no reason. Therefore, in establishing a rule for these deductions, they reasoned in this way: Suppose you were to fix the value of the production of a well for the purpose of fixing its income. You would not do that by the flush flow; that is, the first flow of the well, when it is producing largely. You would want to get at the settled flow of the well. Then it seemed to us that if you wanted to make a deduction, the honest and straightforward rule would be to make the deduction upon the same basis; and this is, in my judgment, as nearly a fair rule as it is possible to get.

"The oil and gas producers do not want anything unfair. They want only the actual depletion. This they failed to get under the old law, and they will get it under this amendment. The amendment as reported by the committee was the result of many conferences; it is fair; I have given my assent to it in conference and know that it is much nearer a just rule than the one which it supersedes. I hope it will not be changed

"In the case of mines it is 'a reasonable allowance for depletion thereof'—that is, for the depletion of the mine—'not to exceed the market value in the mine of the product thereof which has been mined and sold during the year for which the return and computation are made.' Now, that is absolutely fair No matter what it is, whether it is a coal mine or a copper mine or a silver mine What we are trying to do is to ascertain the exact value of the depletion of the mine What has been put upon the product in the way of labor or refining processes should not be estimated, but the value of what is taken out when in the mine: and that is perfectly fair, no matter what it may be, whether it is silver, gold, copper, or coal

"There is no such thing as developing an oil well without drilling the well and putting in capital and labor and time upon it, and these terms here mean this: When you first drill in an oil well it has a flush flow It has gas behind it; it has a head pressure so to speak; and the flow is larger at the beginning than it will ever be thereafter. It gradually goes down. What we want to do is to find an average find what is right find what it has been depleted during the year This rule is that you must take it not by the flush flow, but by the settled flow When the head pressure as they call it goes off, there is a settled production and we take a reasonable amount based upon the settled flow of the well during the year I think that is fair"

APPLIES TO ALL MINES

Senator Shafroth, of Colorado, made the following statement

"The committee have made the rule applicable to coal mines, giving them the right to a reasonable allowance for depletion, not to exceed the market value in the mine of the production thereof, but had made a different rule as to metalliferous mines, namely, the rule of reasonable allowance, not to exceed 5 per cent of the gross value at the mine of the output for the year Now, that is a very indefinite thing It is only for one year—5 per cent for one year—whereas, if we are entitled to anything, we are entitled to the value in the mine of the ore taken out that year When the attention of the caucus was called to it they readily conceded that that part of it should apply to the entire provision, the reasonable value, the same as in coal mines Consequently we struck out the word 'coal' and made it 'mines,' so that it would be applicable to all mines for it can be ascertained just as readily in the case of metalliferous mines as in the case of coal mines

"As to the oil provision, Mr Chilton who knows a great deal about this subject, wrote the amendment himself, explained it, and it was adopted; and I think it is a good provision."

GEOLOGICAL SURVEY BEGINS ISSUANCE OF NEW STATISTICS

In sending out the first monthly statement issued by the Geological Survey relative to coal production in the United States, Geo. Otis Smith believes that the Survey is furnishing the railroads and the coal industry, as well as the general public, information that is timely and valuable. "It is well recognized," says the director of the Geological Survey "that the rate of production of coal, like that of pig iron, is an important index of general industrial conditions, the trend of which is being keenly watched today by all men of affairs. The statements are intended to furnish a basis for comparison of the fluctuations in coal shipments from month to month.

"The coal industry is of such proportions that complete and accurate official statistics of production can be obtained but once a year, and even then require at least six months for collection and compilation. The need for prompt, even though approximate data, led the Survey, a year ago, to begin the collection from railroads of statements covering the carloads of bituminous coal and of beehive coke originating monthly in the coal fields. More than 100 roads, reaching the coal fields in every State and originating more than 90 per cent of the rail shipments of bituminous coal, are now cooperating in this work."

The statement referred to in the foregoing is as follows:

	July, 1916	*June,* 1916	*July,* 1915
Carloads of bituminous coal	376,775	380,041	364,396
Carloads of beehive coke . .	47,569	50,102	46,110

TECHNICAL TERMS OFTENTIMES NECESSARY TO EXPLANATION

The use of technical words and phrases is a subject of increasing discussion. "Technical" is used to describe those words and expressions which belong to some particular profession or trade. Often miners and prospectors speak of technical words as if they were used only by professional men or scientists who wish to write above the ordinary reader. As a matter of fact, all trades and callings necessarily have a great many words which apply only to their work and are therefore technical. The simpler the subject or the more superficially it is treated the fewer are the technical terms but the most ordinary occupations have them. For instance very few farmers "list" corn and "drill" wheat, but those who really study their soils, fertilizers and the plants they raise add a great number of new words to their vocabulary, Frank L. Hess, of the U. S. Geological Survey, points out.

Mining is a calling which deals with subjects unfamiliar to the majority of people, Mr. Hess says, and has developed a large number of technical words. Many of the terms in common use among miners and prospectors are wholly foreign to persons not acquainted with mining. Such words as moil, stope, winze, drift, adit, gouge, singlejack, shoes, dies, etc., mean little or nothing to most persons not familiar with the working of mineral deposits. The jokes told in every mining camp at the expense of the newcomer who is mystified about "horses" in the veins need only be mentioned to make this statement apparent to every man who has had anything to do with a metal mine.

Technical words are necessary to express definite ideas and have the advantage of a specific meaning and usually only one meaning, making it much easier to write exactly with than without them and saving time and effort in writing and expression. To appreciate this, it is only necessary to attempt to describe the objects mentioned "in common language" intelligible to a person unacquainted with mines, for instance, who knows nothing of mines or mining. As the knowledge of ore deposits grows many terms which only a short time ago were considered the special property of the professional geologist or mining engineer are becoming common. Such words as rhyolite, dacite, diorite, ferberite, hubnerite, scheelite, alunite, and the chemical symbols for the rare and heretofore little-known minerals, all of which were, until the last few years, considered too technical for the ordinary man of the camp, have become or are fast becoming common property of all miners and prospectors.

Most of the easily discovered deposits of the precious metals in this country have been found. That the prospector is making himself familiar, through the reading of the technical periodicals, reports of the State and national governments and the study of text books, with many of the less common phenomena of ore deposits and general geology, and necessarily with the terms in which they are expressed, is shown by numerous letters received by the Geological Survey.

Treats of Mine Ventilation

Mine Ventilation is a new bulletin issued by the Jeffrey Manufacturing Company of Columbus, Ohio.

This bulletin illustrates and describes a line of Stepped Multi-Bladed Wheel Type, Centrifugal "Boosters," Propeller Fans, and also small Blower Fans for ventilating entries. It also contains ventilating formulae for Jeffrey Fans, and Tables compiled to give the mine superintendent, mine manager or those interested in this line of work, a comprehensive idea of the results to be obtained from various sizes of Jeffrey Stepped Multi-Bladed Fans.

Copies of this book may be obtained free of charge by writing to the Jeffrey Manufacturing Co., 958 North Fourth Street, Columbus, Ohio, or to any of the following branch offices: New York, Boston, Philadelphia, Pittsburgh, Scranton, Charleston, W. Va; Chicago, St. Louis, Birmingham, Dallas, Milwaukee, Denver, Seattle, Montreal.

Geo. W. Riter Claimed By Death

George W. Riter, a well-known mining engineer of Utah and a member of the American Mining Congress for many years, died of apoplexy at Salt Lake, August 20.

Mr. Riter was born in Salt Lake City, February 22, 1870. He attended the University of Utah and was graduated from the engineering course of Stanford University in 1896. For many years thereafter he was secretary and general manager of the Eureka Hill Mining Company. He was city engineer of Salt Lake City in 1904-1906, and three years ago appeared before the Ways and Means Committee at Washington as a representative of the Utah mining interests in connection with the preparation of the tariff on metals. Mr. Riter was an officer of the Utah Chapter of the American Institute of Mining Engineers at the time of his death, and was a frequent contributor to the mining journals.

COKE BECOMING MORE POPULAR FOR HEATING

Nearly 2,000,000 tons of coke from beehive and by-product ovens were used in 1915 for heating purposes, mainly domestic. For heating, particularly in household furnaces, it possesses many advantages and is said to be coming rapidly into favor. In a general way it has the composition and heating value of anthracite, having the advantage of not clinkering and of igniting more easily, according to the Geological Survey.

The use of raw bituminous coal for heating is wasteful in that the ammonia, tar and benzol are lost without a compensating return in heating value, and the increased use of coke from by-product ovens as domestic fuel is encouraging to all who desire the fullest and best use of our natural resources, Survey specialists declare.

MINING CONGRESS CONVENTION PROMISES TO BE AN UNPARALLELED SUCCESS

By Calling Coal Operators from Fourteen States, Governor Dunne, of Illinois, Has Given Additional Interest to the Gathering Which Will Be Held in Chicago Nov. 13-16—Extensive Exhibit of Machinery and Supplies to Be Shown

Additional impetus will be given to the nineteenth annual convention of the American Mining Congress, which is to be held in Chicago November 13 to 16, inclusive, by the action of Edward R. Dunne, Governor of Illinois, in calling a special meeting of delegates from the fourteen coal mining states to meet in Chicago in association with the American Mining Congress Convention. Governor Dunne called the meeting in order that consideration might be given in the matter of uniformity in laws controlling coal mining operations. It is expected that a recommendation in this regard will be made. J. G. Grossberg, of Chicago, is in immediate charge of the work for Governor Dunne.

The preliminary work for the convention is progressing rapidly in spite of the vacation season. Very much has been done to insure the success of the meeting.

Campaigns have been inaugurated to bring together thinking men from every branch of the mining industry. Assurance is at hand of the attendance of large delegations from the precious metal mining states, the lead and zinc districts, the copper country, the iron and steel mines. As Chicago is headquarters for a large part of the coal output of the middle West, that industry will be well represented.

The entire 17th floor of the Hotel LaSalle is to be given over to exhibit rooms for the mining machinery and supply houses of the country. This space is being taken very rapidly. The demand is certain to be larger than the supply.

The Chicago committees are comprised of real hustlers. They are enthusiastic in their desire to make this meeting a big credit to Chicago. Present indications are that their fullest expectations are to be realized.

James F Callbreath, secretary of the Mining Congress, will leave early in the month for a trip through the copper and iron country of Michigan, with director of the Bureau of Mines, Mr Manning, and State Geologist R. C. Allen, of Michigan. It is planned to hold meetings in the various camps, and secure the cooperation of this state in making the convention a success.

Later in the month Mr Callbreath will leave for a trip to Colorado and Utah, where various meetings are being arranged. It is hoped that every mining man in those states will arrange to attend these meetings. Definite plans for the betterment of every branch of the industry will be formulated.

The Ohio operators are joining heartily in the work looking to the success of the convention. Indications of genuine interest and earnest cooperation, which give hopes of unusual success, are coming from all parts of the country.

One of the features of the work of the Mining Congress in connection with the convention is a special edition of the MINING CONGRESS JOURNAL. This number will be three times the size of the regular issue and will be filled from cover to cover with news matter of the most important interest to the mining industry.

Two illustrated lectures will open the entertainment feature of the convention. One of these lectures will be by Dr Henry Mace Payne, of New York. It will deal with mining in the Arctic regions of Alaska and Siberia. The slides which will be used in this lecture will portray features of mining in the far North which never before have been shown.

The other lecture will be by Edward L. Doheny, of Los Angeles, and will be accompanied by moving pictures showing the Cerro Azul gusher in Mexico. Mr Doheny was a pioneer in developing the great Mexican oil fields in the Tampico region.

GREAT BRITAIN IS ONLY FOREIGN MARKET OPEN FOR TUNGSTEN

The principal buyers of tungsten ore are very much less than fifty, although there are numerous brokers.

Practically the only foreign market for tungsten open to persons in the United States is that of Great Britain. It is understood that all tungsten ores in Great Britain are under the control of the government and they are sold at the uniform price of 55 shillings per unit of a long ton, that is 55 shillings for 22.4 pounds of tungsten trioxide, WO_3. George T. Holloway, 13 Emmett Street, Limehouse, London, England, probably would furnish a good connection between seller and government.

Shipped from Alaska concentrates will undoubtedly sell to better advantage than ore unless the ore contains more than 60 per cent WO_3.

The demand is lessening and the prices are dropping. Fifteen dollars is probably the top price (per unit). The unit in the United States is 1 per cent of a short ton in tungsten trioxide, that is 20 pounds WO_3.

REPEAL APEX LAW; STOP LEASING IDEA, SAYS LEEHEY

Repeal of the Apex law is essential to the best interests of the mining industry, Maurice D. Leehey, of Seattle, thinks. In a letter to the Mining Congress he says:

"The statement of Jesse Knight of Provo, Utah, as quoted in the MINING CONGRESS JOURNAL, expresses my ideas on the proposed Federal mining legislation much better than I could do so myself.

"I am satisfied that any commission to revise the mining laws would be used as a means of advancing the leasing idea and its application to the metallic minerals. Certainly, it would be used to advance legislation which would limit the present power of the State legislatures and increase the power of the bureaus at Washington. That much is evident in the suggestions already advanced. The prospectors and small operators are not prepared to make use of the publicity that would be provided by such a commission, but the so-called conservationists are, and will do so at government expense.

"Then, too, experience has shown that such dreams of ideal legislation are never realized. Even if the commission framed a good bill, it would simply provoke endless debate, and would be so mutilated by Congress that its authors could not recognize it by the time it became a law.

"Let the efforts of mining men be directed toward certain specific amendments, more particularly the repeal of the law of the apex. Do nothing that will impair the present power of the local legislature to provide for the particular local needs of each State or territory. Do not try to frame a uniform law for the arid regions of the southwest, the rainy, fog-swept islands of the Alaska coast, and the Arctic conditions of the Yukon interior.

SATISFIED IN ALASKA

"We are well satisfied in Alaska with the present law relating to the location of mining claims and the mining of metallic minerals. I refer especially to the supplemental legislation by the territorial legislature. Alaska contains perhaps 75 per cent of the unappropriated public mineral lands which will be affected by any such legislation. I am satisfied that the mining men of Alaska would rather adhere to the present law than to take chances upon any general revision, especially a revision inevitably conducted in such a way as to give the theorist reformers of the East and Middle-West, and other ultra-conservation idealists, the best possible opportunity at government expense to air their theories among the great mass of people of this country who know nothing about the subject, but who are impressed with the idea that millions of valuable property are being recklessly exploited. This sentiment controlled our public land administration for several yars to the great detriment of the western States and to the utter stagnation of Alaska development."

In replying to this letter the Secretary of the Mining Congress said:

COMMISSION ONLY HOPE

"If we are unable to convince a commission of fair-minded men after they have been accessible to mining men in the various centers of the West that we need a revision of the mining laws, it seems to me that the situation is hopeless. I doubt whether any bill can be passed unless it has been given special endorsement in such a way as to make it more or less immune to ignorant amendments. For instance, I do not believe the Alaskan Railway Bill would ever have been passed without the impetus given it by the investigating commission.

"The one feature against which more men unite than any other is that in the present law providing for extralateral rights. As your letter states, the people of Alaska are entirely satisfied with that provision. Personally I very greatly doubt the wisdom of its repeal at this time, first, because I believe that questions arising under it have been pretty generally adjudicated; second, the apex law has been charged with the responsibility of a much greater part of mining litigation than it is responsible for (see page 363, August issue, MINING CONGRESS JOURNAL); third, I have been almost convinced by a paper which is in preparation for the next convention of the Mining Congress, by Philip Van Waganen of Denver, that the Apex law is the father of the prospector, and that without the apex the prospector would become entirely a thing of the past. Mr. Van Waganen will show in this paper that the prospector does not exist anywhere in the world except under extralateral right law, and unless he may have a fee simple title to his discovery. To ask Congress to amend the mining law without the aid of a commission means beyond question the abolition of the Apex law.

"In further comment upon your statement that the Alaskans are satisfied with the present law: Are they satisfied, and will they be satisfied with the present law as it applies to deposits of oil, and those deposits which are of non-metallic minerals not found in veins and lodes?

"I am sure we are in accord with the general result desired, and I am also sure that you will agree with me that to make a mining law the football of a bunch of men among whom are some willing to introduce a bill like the one now before the House, providing that the government shall lease its coal lands on the basis of $50 per acre per year for each foot of thickness of coal therein, and its oil lands at $10 per day for each acre not kept producing at its normal capacity, would be a dangerous proposition.

"My own personal belief is that unless we are able to educate and convince a commission of what should be done, we had better leave the mining law alone."

Much Demand for Bowie's Paper

Great interest is being manifested in technical paper 161 published by the Bureau of Mines. In this publication C. P. Bowie describes, in popular language, the general principles involved in the Rittman process of making gasoline.

WESTERN STATES SHOULD PRODUCE GREAT QUANTITIES OF PHOSPHORIC ACID

Immense Amounts of Sulphuric Acid Available in the Vicinity of Great Beds of Phosphate Rocks Cause Fertilizer Makers to Turn to Western Sources of Supply—Much High-Grade Rock Exported

By W. C. Phalen

The important phosphate deposits of the United States are located in Florida, Tennessee, South Carolina, Kentucky, and Arkansas in the East, and in Montana, Idaho, Wyoming, and Utah in the West.

Since the beginning of phosphate rock mining in the United States, there has been a total marketed output of 48,457,906 long tons, more than half of which has been produced in the past 10 years. During this 10-year period there has been an exportation of nearly 11,000,000 tons, or about 43 per cent of the marketed production in the same period. The exported material does not represent average grades, but the highest grade, running 77 per cent and more in phosphate of lime and 3 per cent or less in iron oxide and alumina.

PRESENT METHODS WASTEFUL

The bulk of this exportation is from Florida for obvious reasons. It is plain that the deposits in this state, more particularly, are being wastefully depleted under a system of selecting the cream of the product for export to Europe, leaving the comparatively low grade rock, running from 65 to 70 per cent and under in bone phosphate of lime for our own fertilizer manufacturers to work up after all the best rock is gone, says W. C. Phalen, of the U. S. Geological Survey.

Economical methods of production and hence of conservation are now employed in the phosphate fields of Tennessee, which should serve as a type for all fields. These ought to prove of educational value to American agriculturists and fertilizer manufacturers, and should result in a demand for the highest grade rock, both for direct application to the soil and for use in making acid phosphate. It is certainly evident that the European manufacturer is alive to the situation and is demanding the highest grade Pacific Island and Florida rock. The cost of transporting low-grade rock and the acid phosphate resulting from it is another factor which should appeal to the self-interest, if to no other motive, of the American consumer. This factor, as well as the important one of keeping our high-grade rock at home, is the fundamental reason for a change in our policy with reference to our high-grade phosphate, declares Mr. Phalen. Continuing he says:

METHODS OF CONSERVATION

In the early days of phosphate mining in the more important phosphate fields of the United States there was a large waste of good material. In many places this waste is still going on. In certain localities, speaking more particularly of the Tennessee brown rock field, the material once thrown aside is in such condition that it may be reworked and is actually being reworked. In other places it is lost beyond all hope of recovery. The devising of methods to prevent or reduce such loss and yet maintain the grades set by commercial standards is one of the problems that has faced and is now facing the phosphate rock miner. Fortunately it is in process of being worked out and the Tennessee field is a conspicuous example of progress in this respect.

There is going on in the Mount Pleasant, Tenn., phosphate field, and without doubt in other parts of Tennessee and to a certain extent in other fields, changes that will result in leaving very little good phosphate rock in the ground. Some phosphate is going into the waste ponds, but the time will, without doubt, come when all this material will be reworked, and even now some companies are reworking or planning to rework the old tailings. Modern mining and milling methods are revolutionizing the industry and incidentally conserving this valuable fertilizer material. They are in striking contrast with the wasteful and crude methods formerly employed in the brown phosphate rock field. When phosphate rock was first mined in the Mount Pleasant, Tenn., region, it is safe to say that at least half of the good material, such as is now being worked, was thrown away. A great deal of this cannot, in the nature of things, be recovered for, in the course of time, it has become thoroughly mixed with clay and in places is so covered up with overburden as to make it impossible to work it at a profit. The large operators are using up-to-date methods, but even now some of the small operators are employing the old-fashioned hand methods, which in the past resulted in the loss of much valuable rock.

CHEMICAL METHODS

There is associated with all the large important phosphate rock deposits considerable rock that is not up to the present commercial requirements in content of calcium phosphate. There is also being produced in connection with the preparation of commercial phosphate rock for market a great deal of low-grade material. To bring this class of material up to commercial grade, or to a content of 70 per cent or more of calcium phosphate, various chemical methods have been used. The time will undoubtedly come when these chemical methods will have much more extended application than at present and there will result the conservation of a great deal of phosphate rock now consigned to the waste ponds. Such methods are of more than ordinary interest and are suggested in connection with the western field, owing to the long distances that phosphate rock has now to be transported from this field before it reaches the market. The immense quantities of sulphuric acid potentially available in the immediate vicinity of the western phosphate rock deposits, which should become available in increasing quantity as time goes on, is another important element in the situation. The chemical method of concentrating phosphate to the form of phosphoric acid, superphosphate, or double acid phosphate, and thus enabling it to be transported long distances will probably be worked out in the western field, but, wherever it is worked out, it will be the means of conserving not only the enormous amount of low-grade rock in the Western States, but a large quantity of low-grade rock in the eastern field.

SUBSTITUTES FOR PHOSPHATE ROCK

The use of substitutes for phosphate rock has been in the past of great importance, but since the discovery of large deposits of high-grade rock the price of phosphatic fertilizer has greatly decreased, as a result of which the more highly priced guanos and other phosphate-bearing materials have been driven out of the market. There is still, however, much low and medium-grade material which could, if necessary, actually take the place of phosphate rock as a source of phosphorus and which probably will be used at some future time with changed commercial conditions.

The different substitutes for phosphate rock that have been suggested are as follows: Under the natural substitutes come (1) phosphatic limestone, (2) phosphatic minerals, like apatite, nelsonite, wavellite, (3) guano, (4) marl, (5) excrement, (6) bones, and under the class of artificial substitutes may be included (1) basic slags, and (2) manufactured compounds, such as ammonium phosphate.

PHOSPHATE RESERVES

Though the total phosphate reserves in the United States, are very large and will probably last several generations, it must not be accepted as a truism that our desposits are inexhaustible. On the other hand, at the present rate of production, which without doubt will increase as time goes on, these deposits, especially the high-grade deposits, cannot be expected to last indefinitely.

The United States is now producing for domestic use and export about 3,000,000 tons annually. More than 99 per cent of this comes from the Eastern States, and in 1914 nearly 80 per cent came from Florida. On this basis eastern phosphates should last fully 100 years, taking into account material of good grade.

AVAILABLE FOREIGN RESERVES

From recent available data it is evident that the foreign reserves of phosphate are very large, but apparently they are not so large as those within the United States. It must be considered, however, that the North African phosphate field, which is thought to extend eastward across Arabia into Persia, has not been explored sufficiently to enable us to know even approximately what its real magnitude is. The Algerian deposits are apparently low grade, but their tonnage runs up into hundreds of millions. The high-grade rock of the South Sea Islands, which naturally will be worked first, are estimated at approximately 70,000,000 tons.

STEAM SHOVELS BEING USED EXTENSIVELY IN COAL MINING

Remarkable progress has been made in recent years in the use of steam shovels in mining bituminous coal, according to C. E. Lesher of the Geological Survey. In the coal fields in some of the western and middle-western States there are areas along the outcrop of the flat-lying beds where the cover is insufficient to permit underground mining. For many years sporadic attempts were made to recover this coal by removing the cover with teams and scrapers, but that method is expensive and efforts of that nature have never been of great impotance. The modern steam shovel, however, furnished a means of recovering this coal on a large scale and as experience has accumulated, the size of the shovels and of the operations have increased until now it has ceased to be merely a matter of interest, and is in fact a sizable branch of the coal mining industry.

In a recent paper before the American Institute of Mining Engineers, J. B. Warriner states that the earliest mining on a commercial scale in the anthracite region was a stripping operation. This was the famous Quarry mine at Summit Hill, and "cattle and scrapers" were used to remove the dirt and coal. This work appears to have been done prior to 1821. Mr. Warriner states that the first steam-shovel was used in the anthracite region in 1881. It weighed 30 to 35 tons and had a dipper capacity of one yard. Even today the shovels used there are smaller than those in the bituminous regions, but this is because of the different nature of the work to be performed and the conditions under which the beds occur.

COKE-MAKING IN UNITED STATES HAS ITS MOST IMPORTANT YEAR IN 1915

Necessity for General Use of By-product Oven Is Made Clear by Conditions Arising From War—Public Demands Development of Domestic Dyestuffs Industry—Important Also as Preparedness Measure

The year 1915 was without doubt one of the most important in the history of coke making in the United States, not so much because of the quantity and value of the product, but because of the awakening not only of the public at large but also of the makers and users of coke to the fact that this country has been the most backward of all great nations in the saving and utilization of the by-products to be obtained in distilling coal. The economic effects of the European conflict have forced upon the American people in a manner at once startling and effective, the knowledge of this country's dependence upon Europe and upon Germany in particular for dyestuffs. The realization of the importance of these materials has been brought home to all by the publicity given the matter, and by the scarcity in the stores of the usual profuse assortment of dyed goods. Public interest is growing, in having in this country a dye industry as a measure of industrial preparedness in time of peace, convertible into an explosives industry and therefore serving for military preparedness in time of war.

These are conclusions of C. E. Lesher, coal and coke statistician of the Geological Survey after a study of the year's figures.

Coke ovens of the retort type supply the raw materials from which dyes and explosives are made, and interest centers upon the progress made in recent years in building up this industry. Since 1893 when the first ovens were built in the United States, there has been a steady increase in the use of the by-product process in manufacturing coke. It was not until 1915, with the advent of the war contracts for benzol, and the dye situation, that those engaged in making and using coke came to a full realization of the wastefulness of the old process. They now recognize that the day of the beehive oven is passing and that the future holds much of promise for the manufacturer of by-product coke, Mr. Lesher believes.

SULPHUR NOT ADDING TO NEWS PRINT PAPER COST

In the controversy which has arisen between the publishers of the country and the manufacturers of newsprint paper it is pointed out that sulphur, one of the important raw materials used at the sulphite mills, is contributing no part to the increased cost. Contracts of sulphur are being filled at these mills at the same price this year as has been the case for a number of years.

GEOLOGICAL HISTORY OF GREAT LAKES SET FORTH IN BRIEF

It is supposed that the depressions occupied by the Great Lakes were originally river valleys. During the glacial period great lobes of the continental ice sheet moved along these valleys and doubtless scoured them out, deepening them and broadening them. When the climate became warmer the fronts of these great glacial lobes were melted backward toward the north and northeast and as the outlets of the lake basins were in these directions, these outlets were blocked by ice while considerable bodies of water accumulated in the upper parts of the basins. There were thus formed a series of great glacial lakes. The water rose in each basin until it reached a low place in the surrounding higher land and found an outlet to the Mississippi River or elsewhere. With the gradual recession of the ice front and the opening of new and lower outlets, and still later with changes in the elevation of the land toward the northeast, a whole series of lakes came into existence one after another, having different elevations and different points of discharge. This part of the history of the Great Lakes is quite complex, according to the Geological Survey. It has been described in numerous publications, one of which is an exhaustive paper entitled "The Pleistocene of Indiana and Michigan," published as Monograph 53 of the Survey. It is for sale for $1.50.

When the St. Lawrence valley became cleared of ice and the land in the northern part of the country reached its present elevation the lakes assumed their present proportions. The outlet then came to be by way of the St. Lawrence River, discharging over the cliff between Lake Ontario and Lake Erie and starting the cutting back of Niagara Falls. A brief outline of this history has been published by the Smithsonian Institution, from the Smithsonian Report for 1912, Publication 2201, The glacial and postglacial lakes of the Great Lakes region.

RUSSIAN SURVEY KEEPS ON WORKING DESPITE WAR

Despite the war the geological publications of Russia are continuing to be distributed. A publication of great value just has been received in this country dealing with the geology of the phosphate deposits of the Russian empire. It is by J. Samojloff.

TUNGSTEN PRICES EXPECTED TO FALL TO ANTE-BELLUM LEVEL

Tungsten prices have been falling and in response to inquiries for the reasons the following statement has been prepared by Frank L. Hess of the United States Geological Survey.

To obtain the best basis for drawing conclusions the world's production should be shown, but the figures for 1914 and 1915 are only in part available, for the war has so disturbed many countries that few statistics have been published. Reports from Burma show that a considerable increase in production was made in that country in 1915, and travelers from South America have reported to the Survey that the West Coast countries have had a boom in tungsten mining comparable to that in the United States.

In the United States itself the production in 1915 was 2,165 short tons of 60 per cent concentrates, a production considerably in excess of any former year and more than double the 990 tons produced in 1914. The imports of tungsten ores during 1915 according to figures obtained from the Bureau of Foreign and Domestic Commerce were 1,776 short tons of ore valued at $1,044,866 against 299 tons valued at $139,687 in 1914 In the first quarter of 1916, 967 short tons of tungsten ores valued at $1,721,323 was imported. Besides ore there were imported in 1915, 8 short tons of tungsten metal and ferro tungsten valued at $9,588, and in 1914, 218 tons valued at $22 ,447. It seems from the data at hand that nearly all of the ore imported during the first quarter of this year came from South America, as the countries under the control of the Allies were under an embargo on the shipment of tungsten or tungsten ores. In our country no reliable figures for the production in 1916 are yet available, but undoubtedly the production has been far ahead of any similar period of former years. In other parts of the world an increase of production, like that in North and South America, has taken place.

PRODUCTION IN BURMA

Burma is reported (*Mining Journal*, London, February 19, 1916, p. 123) to have produced during 1915, 2,116 long tons of concentrates. These concentrates are thought to average about 67.5 per cent WO_3, so that they are equivalent to about 2,677 short tons of 60 per cent concentrates. The Indian government imported 2,000 Chinese laborers and these have been put to work on such properties and in such numbers as government representatives have decided, and as a result there will undoubtedly be a considerable increase in production in 1916. The output for the first quarter of 1916 (*Mining Journal*, London, May 27, 1916, p. 363) was 617 long tons (777 short tons of 60 per cent concentrates) as compared with 616 short tons for the first quarter of 1915.

In Queensland (*Queensland Government Mining Journal*, March, 1916, p. 117) 418.3 long tons of tungsten ores and 246.9 tons of mixed tungsten and bismuth ores were produced in 1915 against 240.9 and 193.05 tons, respectively, in 1914. Tungsten ores are understood to be usually concentrated to 70 per cent WO_3 in Australia and arbitrarily taking the tungsten bismuth ores to be half tungsten ore of 70 per cent grade the output for 1915 is equivalent to 708 short tons of concentrates carrying 60 per cent WO_3 against 442 in 1914. There has probably also been an increase of production in other parts of Australia.

BUY LITTLE HERE

The Allies have been supplied mostly from these and other colonial sources, so that they have taken little tungsten from this country. The exports of tungsten and ferrotungsten for the ten months ending April 30, 1916, were only 123,896 pounds, valued at $173,160. No statistics for exports of ore are available, but as the price was fixed by the British government at 55 shillings a unit (long ton), a price far below that in this country, it is not likely that much was exported.

This spring production in this country and in the world at large has been at the highest point ever known. At first the sudden demand created by the orders for war steel was far ahead of the instant productive power of the country. The rapid increase in prices, starting at a time when tungsten mining was at a low ebb and culminating in the undreamed maximum of $110 a unit in March, caused prospecting and consequent discoveries of new deposits; increase of development of known deposits; the operating at high tension of old, and the hasty building of new mills, so that the increase in production was very much faster than the increase in consumption and soon overran the demand which would absorb the output at the extremely high prices and a drop in prices was and is still inevitable, so that it seems safe to prophesy they will reach a considerably lower level.

NORMAL PRICE

What the normal price will be on the return of peace conditions is now hard to estimate, but it seems possible that when the demand recedes to its natural proportions prices may, owing to over-production and unless hindered by artificial means, fall close to the level of those obtaining before the war.

As in all times of such sudden and great rises in prices, many properties unworkable in ordinary times will have been opened and equipped for operation, sometimes without due regard for the future, and some schemes have bordered close on or have been entirely fraudulent. The investors in all three classes will be hurt by the inevitable results. Other properties properly handled will logically close, and with a profit, on the advent of the lower prices sure to come, and others will have been developed which can operate profitably under normal conditions of trade.

Rice Acts as Director.

George S. Rice, chief mining engineer of the Bureau of Mines, acted as director of the Bureau last month during the absence of Van H. Manning in the West.

GOVERNMENT EXPERTS WELL KNOWN TO MINING MEN

C. T. LUPTON
Geologist

To accept an important position with the Cosden Oil & Gas Company, of Tulsa, Okla., Charles T. Lupton has tendered his resignation to the United States Geological Survey. Mr. Lupton will serve the Cosden Company as a geologist.

Mr. Lupton was born in Mount Pleasant, Ohio, February 28, 1878. His education was acquired in the public schools at Mount Pleasant and in the Oberlin Business College and Oberlin College. From the latter institution he received a degree of A.B. in 1907. Later he was awarded a degree of LL.B and LL.M. by the National University Law School in Washington. Mr. Lupton began with the Geological Survey in 1907 as geologic aide. In 1910 he was made a member of the coal land classification board of the Survey, and has been in charge of some very important work in the following mining regions: Bull Mountain District, Montana; Orofino District, Idaho; Western part of Olympic Peninsula, Washington; Gallup District, New Mexico. Northeastern and central Utah mining districts and northern and central mining districts of Wyoming.

Mr. Lupton will begin his new duties next month.

GEOLOGISTS PLAN INTERESTING SUMMER FIELD TRIP

Geologists from twenty-five States are expected to join in a field trip which will be given by the Associated American State Geologists early next month. George Otis Smith, director of the Geological Survey, will accompany the geologists. The intinerary is as follows:

Monday evening.—Assembly and conference in the State Museum.

Tuesday.—By train or auto to the Helderberg Mountains; classical section of the Paleozoic from "Hudson River Shales" (Indian Ladder and Canajoharie beds) up through the "Lower Helderberg" (Manlius Coeymans, New Scotland) Oriskany, "Upper Helderberg," Onondaga, Marcellus, Hamilton. Panorama of the Mohawk and Hudson from the Indian Ladder Cliff, an extensive view of erosional topography on a very large scale.

By auto to Thompson's Lake. Thompson's Lake lies on a limestone plateau in a karst or solution cavity with concealed outlet. This Helderberg limestone plateau is notable for its karst topography.

Return to Albany by auto or train.

Evening conference in State Museum.

Wednesday.—Leave by train for Saratoga Springs; autos through the State Mineral Springs Reservation under guidance of the officials. Exposition of the hydrology and geology of the Springs basin (140 mineral springs are now spouting under CO_2 head.)

Autos to Lester Park or Cryptozoon Ledge (property of State Museum) a reef of marine algae in the Hoyt (Cambrian limestone.)

Train to Port Henry, Lake Champlain, faulted Ordovician (Beekmantown and Trenton); Precambrian (Greenville, syenites, gabbros) along railroad. Cheever Magnetite mine.

Evening at Port Henry.

Thursday.—Train to Mineville; Witherbee, Sherman Co. magnetite mine, largest in America. Examination of mine and mine workings.

Afternoon to Port Henry, to Port Kent; sections of Potsdam and crystallines along the lake front south of Port Kent.

Night at Port Kent.

Friday.—Port Kent to Ausable Chasm, a post glacial gorge through Potsdam sandstone; very picturesque.

From Port Kent by motor or steamboat to Cliff Haven (fourchite and monchiquite dikes) and Valcour Island (extensive Ordovician section) thence to Plattsburg.

Evening at Plattsburg.

Saturday.—From Plattsburg across Lake Champlain to Burlington, Vt. Meet State Geologist Perkins of Vermont and under his direction visit the attractive University of Vermont.

The only possible source in the United States of material for making agate mortars and pestles known to the U. S. Geological Survey is near Austin, Texas. Here agate nodules weather out from some of the sedimentary beds and are said to be suitable for such work.

U. S. MINES LITTLE NICKEL: SOME SAVED AT SMELTERS

A little nickel ore is said to have been mined in southern Nevada within the past year, but the Geological Survey has no definite information with regard to it. The other nickel deposits have been idle but a considerable quantity of nickel, probably between 700 and 1,000 tons, is produced as a by-product in the electrolytic refining of copper. Most of this nickel is now produced in the form of very pure metal by electrolytic processes, though a considerable quantity is still put on the market as nickel salts for use in plating. In the United States there are nine or ten nickel properties which are potential producers of the metal, though not on a scale comparable to the possibilities of nickel mining at Sudbury, Ontario.

IMPORTANT FIELD MEETS IN INDIANA AND ILLINOIS

Important field meets of mine rescue and first aid men are to be held this month in Indiana and Illinois. Each will be the most important event of this kind ever held in the State. The Indiana meet will be held at Clinton, September 4, and the Illinois meet at Spring Valley, September 9.

W. D. Ryan and Dr. W. A. Lynott, of the Bureau of Mines will attend. In addition, D. J. Parker, H. I. Smith, J. R. Fleming and G. T. Powell will represent the Bureau of Mines at one or both of these meets.

Ready for Distribution

Among the publications which became ready for distribution by the Geological Survey during the past month are the following:

Bulletin 640-B, "Reconnaissance of the Conconully and Ruby Mining Districts of Washington," by Edward L. Jones, Jr.

Bulletin 642-D, "Mining on Prince William Sound in Alaska," by eBrtrand L. Johnson.

Bulletin 642-H, "The Cosna-Nowitna and Ruby-Kuskokwim Regions, Alaska," by H. M. Eakin, J. B. Mertie, Jr., and G. L. Harrington.

Bulletin 623, "Petroleum Withdrawals and Restorations Affecting the Public Domain," by Max W. Ball.

"Platinum and Allied Metals in 1915," by James M. Hill.

"Bauxite and Aluminum in 1915," by W. C. Phalen.

Peru Furnishes Bulk of Vanadium

The great supply of vanadium comes from the sulphide ores (patronite vanadium sulphide of Minas Ragras, Peru, which are mined by the American Vanadium Company of Pittsburgh, and from the roscoelite (a vanadium mica) bearing sandstones of southwestern Colorado, which are mined by the Primos Chemical Company at Vanadium Colorado.

OVER HALF MILLION VISIT THE SAFETY FIRST SPECIAL

During a four months' tour of the country, 500,000 persons visited the Government Safety First Special. The train returned to Washington August 31. The exhibits have been dismantled and the cars returned to the Baltimore and Ohio Railroad Company.

As a result of the extensive tour made by this train an insistent demand has developed in many parts of the country to see this exhibit, which shows some of the work being done by the Government to safeguard life and property. There is strong sentiment to make such an exhibit permanent. The matter is now being considered by the Secretary of the Interior and it is possible that Congress will be asked to appropriate for a train of this character.

HEALD BEGINS STUDY OF OSAGE OIL LANDS

Work of mapping the detailed geological structure in the Pawhuska Quadrangle in the Osage nation of Oklahoma is being undertaken by K. C. Heald, of the United States Geological Survey. Mr. Heald will continue the studies begun by Carl D. Smith prior to his resignation from the Geological Survey. It is expected that this work will now be brought rapidly to completion. The Pawhuska Quadrangle includes some of the most important oil and gas lands in the country.

VERNADSKY HEADS GEOLOGICAL BUREAU OF RUSSIAN EMPIRE

W. Vernadsky has been made director of the Museum of Geology and Mineralogy of Russia. He also has been elected to the upper house of the council of state, being one of the six members chosen from the universities of the Empire. Mr. Vernadsky is known to a large number of geologists in the United States as he made an extended visit here four years ago.

Divide Up Phalen's Work

As a result of the resignation of W. C. Phalen, from the Geological Survey, to accept a position with the Bureau of Mines, H. S. Gale has taken over his potash work. Mr. Gale also has been working on potash and is recognized as one of the country's leading authorities on this mineral. P. S. Smith will take over sulphur, iron, pyrite and sulphuric acid. R. W. Stone will take up Mr. Phalen's work in phosphate salt and bromine. J. M. Hill will take over the work of bauxite and aluminum. No addition to the force will be made as a result of Mr. Phalen's resignation.

Manning Honored.

Van H. Manning, Director of the Bureau of Mines, has been appointed a member of the National Research Council of the National Academy of Sciences.

OKLAHOMA INCREASES SPELTER PRODUCTION BY MORE THAN 15,000 TONS

Output of Zinc Ores During the First Six Months of Current Year Shows Considerable Increase—Consumption Also Increases, But Not in Same Proportion as Output

Figures compiled by C. E. Siebenthal, of the United States Geological Survey, Department of the Interior, from reports submitted by all zinc smelters operating during the first six months of 1916 show that the production of spelter from domestic ore in that period was 267,696 short tons and from foreign ore 48,756 short tons, a total production of 316,452 tons, compared with 272,987 tons for the last half of 1915 and 216,532 tons for the first half.

The output of spelter by Illinois smelters increased over 5,000 tons for the six-month period, and that of Kansas over 8,000 tons, but the gain in Oklahoma was the greatest of all—over 15,000 tons—a result of the completion of a part of the large contemplated increase in smelter capacity announced early in the year. The remaining spelter-producing states also made a large gain, principally in Pennsylvania, where the new smelter at Donora was put into complete operation. The output of primary electrolytic spelter, amounting to 1,697 tons, is also included in the production of these states.

The stocks of spelter held at smelters on June 30, 1916, amounted to 23,817 tons, against 14,253 tons at the beginning of the year and 5,884 tons at the middle of 1915. This shows a gain over stocks at the close of the year, part of which was doubtless due to the accumulation of working stocks at new smelters which started during the period

From the foregoing figures and the records of the Bureau of Foreign and Domestic Commerce it is calculated that the apparent consumption for the period was 229,086 tons which compares favorably with 203,588 tons for the last half of 1915 and 160,906 tons for the first half This consumption was not altogether domestic, however, for it must include the zinc content of the exports of brass and brass articles, which, as will be seen from the table of exports by classes, were largely increased during the first half of the present year

In addition to that produced from ore 15,800 tons of spelter was distilled or recovered electrochemically from zinc ashes, skimmings, and drosses. Probably one-fourth of this output of secondary spelter including the considerable quantity of electrolytic secondary spelter, was of high grade. No statistics were obtained of the spelter produced by remelting skimmings, drosses, etc., but it was probably not less than 12,000 tons. The total output of spelter from both ore and skimmings was therefore about 344,000 tons, or at the rate of 688,000 tons a year.

MINERS' CIRCULARS IN FOREIGN LANGUAGES TO BE OUT SOON

Within two months the Bureau of Mines hopes to have ready for distribution circulars with regard to Safety First and First-Aid Work in mines. Three foreign languages are to be used in setting forth this information. These circulars will be issued in Italian, Polish and Slovak. In each case the English from which the translation is made will appear in a parallel column.

Numerous applications are now being received asking that the same circulars be printed in Finnish. It has been brought to the attention of the Bureau of Mines that there are a large number of Finnish miners in the country, and it is probable that the circular will be translated for them as well.

Since the establishment of the Bureau of Mines the plan of publishing certain information in foreign languages, so as to reach the miners who are not familiar with English, has been considered. At first considerable opposition developed to this plan. It was argued that it would retard the efforts of the foreigners to learn English. Since it is so highly desirable that all immigrants acquire a knowledge of English, the Bureau of Mines deferred the publication of these circulars until an investigation could be made.

It has been established that of the 750,000 mine laborers in the United States nearly one-half are foreign born. Considering the few educational advantages which were enjoyed by this class previous to their coming to America they make remarkable progress with the English language. Among those who come to this country after attaining the age of thirty years however, it has been noted that few of them acquire a sufficient knowledge of English to read it readily. In fact when they are able to read English at all it is so labored as to be a hardship. After this was established it was decided that great good could be done by circulating the information in the native languages of the miners. By placing the English translation in a parallel column it is believed that it will be of actual instructive value and will tend to encourage the learning of English rather than retard it. It is the intention of the Bureau of Mines to amplify this service as soon as its utility is proven in actual practice.

GOVERNMENT EXPERTS WELL KNOWN TO MINING MEN

(*See Cut on Front Cover.*)

Philip S. Smith was born at Medford, Mass., July 28, 1877. His early education was secured in the public schools around Boston, and in a preparatory school at Poughkeepsie, N. Y., after which he entered Harvard and was an under-graduate until 1899 in which year he received his A.B. degree. He was awarded a degree of A.M. at Harvard in 1900 and in 1904 the degree of Ph.D.

Mr. Smith undertook his first work in the copper mines of Vermont and later joined the Geological Survey of Michigan. His work with the latter organization was exclusively in the copper district of the upper peninsula. Following this he spent some time in private employ, doing geological work in the Lake Superior region in Canada in iron and at the zinc deposits of New Jersey.

During his service with the United States Geological Survey, Dr. Smith has done work in the Black Hills, in the gray iron ore district of Alabama, and in the following mining districts in Alaska: Nome, Solomon, Seward Peninsula, Nulato-Council City, Toyukuk, Kobuk-Noatak, Fairbanks, Ketchikan and Illamna-Iditarod.

Since 1914 Dr. Smith's work has been confined largely to service in the Washington office as administrative geologist. In the absence of the director he serves as acting director.

During the current year Dr. Smith found time to make an investigation as to the field occurrence of sericite as a source for potash. He also just has completed a description of the topography and physiography of the Watkins Glen region of New York.

For four years Dr. Smith was instructor in geology and physiography at Harvard, in addition giving courses on the economic geology of certain non-metallic products, and summer courses during which he visited the various mining regions of Colorado. During that same period he also was instructor in Radcliffe College.

In the reassignment of the work at the Survey, made necessary by the resignation of W. C. Phalen, Dr. Smith will take up the work of sulphur, iron pyrite and sulphuric acid.

Dr. Smith is a Fellow in the Geological Society of America, a member of the Association of American Geographers, Geological Society of Washington, The Washington Academy of Science and the Harvard Travellers' Club.

DIFFERS FROM WOODBRIDGE AS TO ORE SAMPLING

After reading the interview with T. R. Woodbridge on the "Standardization of Ore Sampling Methods," which appeared in the August issue of the MINING CONGRESS JOURNAL, F. Meyer, 618 14th Street, Denver, Colo., submits the following conclusions with regard to the standardization of ore sampling methods. It will be noted that in some points Mr. Meyer's conclusions vary from those of Mr. Woodbridge. Mr. Meyer's conclusions are summed up as follows:

1. High grade ores, especially spotty gold or silver ores, require a particularly large sample with fine crushing and grinding.
2. Medium and low-grade ores of fairly uniform character do not require such a large sample nor such fine crushing and grinding.
3. It would be, therefore, waste of time and money to make one standard method of ore sampling obligatory for all smelters and sampling works.
4. The crushing of all the ores to one quarter of an inch or even to half an inch would be prohibitive for the running of custom smelters with pyritic smelting.
5. If the ore is spotty, no matter how carefully the sampling is done and how finely the ore is ground, there is always a larger or smaller discrepancy of values in the different assay samples.
6. The keeping of at least 2 per cent of the ore as sample for eventual resampling until settlement is made ought to be ordered by law for all custom smelters and public sampling works.
7. The old method of taking every tenth shovel from large lots of low-grade ores gives satisfactory results to everybody concerned if the rest of the sampling is done with due care and cleanliness and if also proper care is taken that the proportion of fine and coarse material is maintained in the sample.
8. The sampling of ores including moisture sample just as well as the weighing is, and always will be, a matter of trust.
9. As a panacea against certain deficiencies in the ore sampling works and in the marketing of the ores a bill was introduced, several years ago, in the State Assembly of Colorado to erect State sampling works in the different mining camps and mining centers of the State, thus regulating not only the sampling but also, to a certain degree the marketing of the ores, as it is not so much the sampling itself as the various charges, penalties, deductions, variations of prices in the different grades of ores (compare f. i. schedules of lead and zinc ores) which cause distrust and dissatisfaction. The bill was killed before its first reading by the influence of certain interests.

As a compromise, it might be suggested that the sampling foreman of every custom smelter and sampling works be *a government employe* paid by the government and qualified to select the one method of sampling suited best to local conditions and character of ores.

F. M.

GOVERNMENT EXPERTS WELL KNOWN TO MINING MEN

MAX W. BALL
Bureau of Mines.

Max W. Ball, mining engineer, of the Bureau of Mines, comes of a race of school teachers, but claims that he himself has so far avoided teaching. His father taught between farming seasons in Illinois, his mother taught in Iowa, his only sister is now teaching in Denver, and most of the rest of his near relatives have taught at one time or another. Enough is enough for one family, says Ball, and so, although he has been burro-guide, cowpuncher, farm hand, miner, surveyor, engineer, geologist, and lawyer, he has never been a school teacher.

Ball says he wasn't lucky enough to be born in the West, but had the good fortune to be taken there at an early age. He was born in 1885 on a farm in Munson township, Henry County, Illinois, where he flourished with the calves and the corn-fed pigs to the age of seven. Then his father died, and his mother took him and his sister to live in Geneseo, Illinois. Three years later they moved to Manitou, Colorado, where they lived until Ball finished his high school work. From his father he inherited a fondness for horses not too gentle, and at twelve he was in the saddle as a burro-guide. This, with intermittent work ranging from wheelbarrow to roundup, kept him more or less out of mischief and more or less in funds through succeeding summers.

When Ball graduated from Manitou high school the family moved to Golden, Colorado, where Ball entered the Colorado School of Mines. Between terms he went back to the Pike's Peak trail or mucked and trammed in the mines of Idaho Springs and Central City. In 1906 he graduated with degree of Engineer of Mines.

For a short time he carried chain and took out logarithms for a deputy mineral surveyor in Central City, but there was too much office work for Ball's taste. When an offer, indefinite as to terms and none too promising in tone, came to join a United States Geological Survey party, he was on his way within twelve hours. On August 3, 1906, he joined the Survey at Rawlins, Wyoming, and until April of this year he had been with the Survey ever since.

The Rawlins party was under A. C. Veatch and was doing topographic and geologic mapping of coal fields. Ball acted as teamster and field assistant and when the summer was over Veatch brought him to Washington as a draftsman. The following summer he was given charge of a party mapping the Little Snake River coal field of southern Wyoming and northern Colorado, which work he continued for nearly two years.

His life in the West and his association with Veatch had given him a deep interest in public-land matters, and in March, 1909, he was placed on the staff of the Land Classification Board, recently formed to handle problems connected with the Survey's conservation work. His especial interest was in cooperation with the Land Office in the exchange of data regarding the mineral character of public lands, and of this work he had immediate charge from the adoption of the first cooperative agreement to the time of his leaving the Survey. He early found that public-land problems have many legal aspects, and he according entered the National Law School, from which he received the Master of Laws degree in 1914, being admitted to the Bar of the District of Columbia in October of the same year.

Late in 1910 he was made Chairman of the Oil Section, Land Classification Board, and for the remainder of his time with the Survey he gave especial attention to oil matters. He is particularly interested in problems connected with the leasing of oil and gas lands and with Government administration of its oil fields. Just before leaving the Survey he prepared a bulletin giving the history and purpose of oil-land withdrawals and containing an exhaustive discussion of oil-land law. He has spent much time in the coal and oil fields of Wyoming, Colorado, New Mexico, and Utah, and has visited those of other States.

On April 1, 1916, Ball transferred to the

Bureau of Mines, where most of his time is given to legal and administrative matters, though he still keeps in touch with the oil situation.

In addition to the bulletin already referred to, Ball has written preliminary reports on the Little Snake River coal field, published in Survey Bulletins 341 and 381; "The History and Legal Basis of Land Classification," appearing as a chapter of Bulletin 537; and a paper on "The Placer Law as applied to Petroleum," published by the American Institute of Mining Engineers.

LIGNITE GAS SHOULD BE USED LARGELY FOR HEATING, IT IS SAID

Because of the ease with which the gas is produced, the low price of the original lignite, the value of the residue, and the low price for which it could be sold if manufactured in a plant used to produce briquets from the residue, the lignite gas should have a large commercial utilization for heating, lighting, and power purposes. It has been found that briquets made from this concentrated residue produce a most excellent fuel, for all practical purposes approaching the efficiency of anthracite, says E. J. Babcock, of the Bureau of Mines, one ton of the air-dried lignite will produce from a half to two-thirds of a ton of briquets in addition to 8,000 or 10,000 cubic feet of gas. The briquets have about twelve-thirteenths the actual heating value of hard coal, and they can be shipped for considerable distances and still prove profitable. The briquets present many advantages, especially over the original lignite as usually placed on the market. The heating value is nearly doubled, the briquets do not disintegrate on standing or burning, they can be stored without being affected by atmospheric conditions, they are uniform in size and are convenient to handle.

No detailed statements of the cost of operating a large commercial plant are given in this report for the reason that the cost per ton of briquets and per 1,000 feet of gas and other by-products will depend upon a large number of factors, any one of which may materially affect the cost. For example, the cost of production is much less in a large plant than in a small one, and also less in a plant favorably situated—that is, near a mine, a city, and railway facilities. The use of mine slack, the percentage of moisture in a given lignite deposit, and the relative cheapness of mining and ease of delivery to the plan are all variable conditions and would have to be determined for each individual plant

In addition, the plant could be operated under many modifications of the general process that has been explained; for example, all or a part of the gas might be sold for heating or lighting purposes or converted into electricity. The extraction and production of gas might be carried further in one plant than in another, or the by-products, such as tar and ammonia, could be recovered and marketed, used in part, or entirely neglected. Differences in any of these conditions would materially modify the cost of production.

In general, the larger the plant and the more complete the saving of by-products the smaller will be the cost of production. It is believed that in a carefully constructed and operated plant the saving and utilization of the various by-products will so reduce the cost of operation as to make the industry commercially practical and profitable.

All of the data obtained from the investigations and the operation of the experimental plant indicate that a plant of fair capacity, if so constructed as to economize in the original cost, as well as in the cost of operation, and if operated efficiently and under careful management, should turn out excellent commercial products at a cost that would admit of a fair profit.

Although the general principles involved in the process explained are not complicated, the proper observance of the many details of operation is essential to success, and those managing and operating the plant should have had technical training and experience.

The development of methods for the utilization of low-grade coal will prove of much value to those communities nearest the great lignite deposits in the West. In some of these the lignite could be converted into electricity, which, in turn, could be sent to surrounding towns and villages, thus distributing power and light from numerous central power plants. Such an arrangement would not only be a great saving of our fuel resources but would also result in the establishment of many industries that can be developed by abundant and cheap electric power, Mr. Babcock concludes.

The existence of vast deposits of lignite in the West Central and Western States is well known, although the extent and importance of the deposits have not been appreciated, nor has there been an adequate economic utilization of the deposits.

The work of the Bureau of Mines, the United States Geological Survey, and the State geological surveys is disclosing an increasingly large area, underlaid with this kind of coal. Among the States having the largest workable deposits may be mentioned North Dakota, Montana, Wyoming, Colorado, and Texas, and in several other Western States lignite occurs in smaller areas. In North Dakota alone it is estimated that the deposits cover approximately 32,000 square miles, many of them being 10 to 15 feet thick and capable of producing in all several hundred billions of tons of lignite.

PHALEN LEAVES SURVEY FOR BUREAU OF MINES BERTH

W. C. PHALEN

Now with the Bureau of Mines.

W. C. Phalen of the Geological Survey has been transferred to the Bureau of Mines at an increased salary. Mr. Phalen is credited with having done very excellent work on the Survey on sulphur, salt, potash, salines, bauxite and phosphate. He goes to the Bureau of Mines as mineral technologist under Dr. Charles L. Parsons.

BUREAU OF MINES RESCUE CARS TO BE REPAIRED

George S. Rice, chief mining engineer of the Bureau of Mines, appeared last month before the appropriation committee of the House to emphasize the need of the $26,000 asked for by the Bureau of Mines for repairs to existing mine rescue cars. Inspectors of a number of railroads have refused to haul these cars owing to their lack of repair. No appropriation has been furnished for repair work and a number of the cars have been running for many years without attention. The appropriation was included in the deficiency bill.

NEW MINE RESCUE CARS ARE BEING CONSTRUCTED

A contract has been let by the Bureau of Mines for three new steel mine rescue cars. The new cars are to be situated at Reno, Nev., Raton, N. Mex., and Butte, Mont. They will be completed in January. Owing to the wording of the appropriation the crews cannot be put out in advance of the cars, thereby handicapping, to a considerable extent, work which should have begun at once.

The cars are being built by the American Car and Foundry Company, at Wilmington, Del. The cars will be the last word in improved rescue cars.

MILWAUKEE ASKS BUREAU OF MINES FOR ADVICE

As a result of the efficient work done by the Bureau of Mines at the Cleveland tunnel explosion, a request has been made by the city officials of Milwaukee asking that the Bureau of Mines advise with the city engineer in regard to the extension of a tunnel under the lake at Milwaukee in which similar conditions are liable to be encountered. The request has not been acted upon as yet, but it is practically certain to be granted.

Puts Journal on Pedestal

An unsolicited testimonial with considerable "punch" in it comes from S. O. Stewart, General Manager of the Premier Mining Company, of Winkelman, Arizona. He says,

"I wish to congratulate you upon putting out such an interesting journal. I read every article in it with avidity. I take other mining papers but no one of them compares with the Mining Congress Journal."

Rittman Process Popular

Licenses have been granted to twenty-three oil refiners for the use of the Rittman process. No royalty is charged for the use of this method of refining, but each person taking out a license agrees to patent, in the name of a trustee for the public, all improvements that may be devised or discovered. In this way it is believed that the public will be the chief beneficiary of the Rittman discovery.

Matthew Henry Walker Dies

Matthew Henry Walker, president of the Walker Bros. banking house of Salt Lake City, died July 28. He had been an active member of the American Mining Congress for many years.

To Meet in Birmingham

Birmingham, Ala., will be the scene of the next annual meeting of the Lake Superior Mining Institute. It will be held there March 13 to 17.

CONGESTED STORAGE AND OVERPRODUCTION CAUSE OIL PRICES TO TUMBLE

Development in Kansas Slows Up Drilling in Mid-Continental Field, it is Said—Million Dollar Refining Company to Operate in Oklahoma Field

(Special Correspondence)

Tulsa, Okla., Aug. 25.—The price of crude oil of the Mid Continental oil field has been reduced recently from $1.55 to 95 cents. This applies on light oils, paraffine base, ranging in gravity from 32 to 41.

The pipe line companies state that the reason of this reduction is on account of the congestive storage and over-production in the larger fields of Kansas and Oklahoma. Drilling operations have practically ceased in all of the fields to give the pipe line companies an opportunity to move this congestive storage.

The only wells that are being drilled in at present are offset wells and wells that are required to be drilled to hold leases. All of the oil operators, however, firmly believe that the market will soon react and that the price of crude oil in this section will bring a higher price than before the decline.

Many of the independent operators are now building small refineries and putting their oil in storage from the wells already drilled in so as to sell the refined products to the different jobbers of refined products in the North, and therefore secure a better price for their oil worked up into refined products than they could secure by selling it in the crude state at the present selling price of crude oil.

The Marion Refining Company has been chartered by the State of Oklahoma with a capitalization of $250,000 and is now amending its charter, increasing its capital stock to $1,000,000 and the papers on it will be filed in a few days. The officers and directors of the refining company are: A. M. White, president (president of the Starky Oil & Gas Company and vice-president of the White Oil Company); A. S. Nelson, vice-president (president of the Albemarle Producing Company and treasurer of the Grand River Gas Company), and G. W. Fry, secretary and treasurer (vice-president of the Albemarle Producing Company and vice-president of the Grand River Gas Company), and the refinery will be erected and completed as soon as possible at Chelsea, Okla., 18 miles north of Claremore.

The Chelsea oil of the Chelsea field, runs high in gasoline and the Marion Refining Company is now arranging to sell its gasoline, distillates and refined products. The daily capacity of the refinery will be from 1,000 to 3,000 barrels per day and the refinery will be so constructed with units that the capacity can be increased to 10,000 barrels per day.

The officers of the refining company are officers in three producing companies, and these producing companies will sell its production to the refining company. In addition to this, the refining company will buy additional crude on the open market by contract from other independent producers. The refining company expects to be in operation and selling its products within the next four months.

Mr. George W. Fry, secretary and treasurer of the refining company, is now in the North in the interests of the refining company.

The securities of the refining company are being sold through Terry & Brinkley, of Guthrie, Okla., who have northern connections.

NICKEL PRODUCTION IN 1913 WAS 30,000 TONS

The latest statistics of the world's nickel production available at the U. S. Geological Survey are those given by the Metallgesellschaft of Hamburg, for 1912, in which the production is listed as follows:

Canada, United States, and England (all of this production is from Canadian ores)	20,200 metric tons
Germany	5,000 metric tons
France	2,100 metric tons
Other countries	1,200 metric tons
Total	28,500 metric tons

For 1913 the total is given as 30,000 metric tons but is not itemized.

Amenable to Flotation

Molybdenite seems to be more readily amenable to separation by one of the flotation processes, either oil or the surface tension of water, than to separation by gravity. Henry E. Wood & Company, 1734 Arapahoe Street, Denver, Colorado, has worked out a process for the separation of molybdenite from its gangue by flotation through the surface tension of water.

THE
MINING CONGRESS
JOURNAL

PUBLISHED EACH MONTH BY
THE AMERICAN MINING CONGRESS.
Munsey Building. Washington, D. C.

Subscription Rate, per year.............. $2 00
Single Copies.......................... .20

Entered as Second Class Matter January 30, 1915, at the Postoffice at Washington, D. C.

SEPTEMBER, 1916

EDITORIALS

THE REVENUE BILL AND THE MINING INDUSTRY.

It will be gratifying news to the mining men of the country that the Senate Finance Committee has recognized the injustice of the provision of the present income tax act with reference to deductions authorized from gross income in estimating the net income upon which the Federal Income Tax is levied.

It will be recalled that the act, over the protest of mining men, fixed a limit of five per cent of the gross value of the output of mineral as the maximum amount which could be deducted from gross income for depletion and exhaustion. At the time of the enactment of the original income tax bill the gross unfairness of singling out the mining industry for special restrictions was pointed out and further that the mineral taken from a mine took just that much from the total value of the property and was a sale of a part of the property rather than an income from its operation. In the case of the United States vs. the Nippissing Mines Company the conclusion reached by Judge Lacombe in the United States District Court for the southern district of New York, upheld this conclusion. A part of this opinion is as follows:

"If the known value of an ore bed were exactly $2,000,000 and exactly $500,000 were taken out of it each year, in four years there would be nothing left. It is difficult to say why it may not reasonably be said that the ore bed suffers each year a depreciation of $500,000, just as a $10,000 piece of machinery, with a life of ten years, suffers a depreciation of $1,000 each year."

Notwithstanding this illustration the law provided a limitation of five per cent and the Commissioner of Internal Revenue construed this to mean 5 per cent of the selling price. The average selling price of coal in the Pittsburgh district last year was approximately $1.20 per ton. A five per cent deduction amounts, under the present law, to six cents on each ton of coal mined. In the Pittsburgh district coal lands have cost the operators approximately ten cents per ton of coal in the ground. This value is constantly enhanced by taxes and interest upon the investment. It would be a fair assumption that the royalty value of coal in the Pittsburgh district is at least fifteen cents per ton. The deduction of six cents allowed under the present law leaves the remaining value of nine cents on each ton of coal mined, subject to a tax which is in reality a tax upon the capital invested rather than upon the income, an injustice which is so apparent that no argument is necessary for its demonstration.

Pittsburgh is cited because it is the center from which a larger amount of coal is mined than in any other one district.

In the metal mines the injustice is even greater than in the coal mines because the royalty value of these properties is greatly in excess of the proportionate royalty value of coal. Ten per cent is about the lowest royalty ever considered for low grade ores and in many instances a royalty as high as seventy-five per cent has been paid to the mine owner by a lessee operating under the royalty basis. This has worked a very great injustice to many of the large mining companies, and would have been still more burdensome under the increasing percentages to be levied by the present revenue bill.

The members of the Senate Committee on Finance are to be congratulated for having given the mining industry a fair deal and it is hoped that these provisions of the bill will meet the approval of both the Senate and House.

Attention is called to the news columns where the exact language of the paragraph of the revenue bill dealing with this matter is quoted verbatim.

MID-YEAR STATEMENTS PUBLISHED WIDELY

Through the returns from clipping bureaus it is possible to establish quite definitely that a circulation of no less than 35,000,000 has been given the mid-year reports of the United States Geological Survey on the mineral output of the country during the first six months of the current year.

Few undertakings on the part of any bureau have been crowned with such spontaneous success. The secret is that the statements, giving the returns on mineral production, were given out while the information they contained was news.

These reports do not contain the same details as do the regular reports which appear later, and, of course, they are not absolutely accurate. They are so nearly correct, however, as to be all that is required for the general public. In fact many technical men find the mid-year and year-end statements sufficient for their work.

Newspapers of the country are very ready to publish current data. Newspapers are not histories, however, and they are very begrudging of any space for a report referring to past conditions.

It is greatly to the interest of the mining sections of the country that more publicity be given their great industry. Publication of information aggregating thousands of columns, showing the immense values of the country's mineral production brings home to people not directly interested the importance of the mining enterprise.

While nearly all newspapers, great and small, in the mining sections of the country used these mid-year statements their publication was not confined to newspapers in mining areas. New York papers as well as papers in the large cities throughout the country used this matter quite fully. A large percentage of the smaller papers also used a great deal of this material.

Director George Otis Smith of the Geological Survey is a result-getting sort of individual and the mining industry is profiting hugely as a consequence of the work's being done by the powerful organization with whose direction he has been entrusted.

INTEREST IN SMOKELESS FIRING OF COAL

The demand from the public for technical paper 80 of the Bureau of Mines, which deals with the proper methods of firing coal, became so great as to necessitate its reprinting. Many meritorious publications are offered to the public but in some cases they apparently are not appreciated. This was not the case, however, with technical paper 80. The demand for it was heavy from the time of the announcement that it was ready for distribution. It indicates that the public is very much interested in suppressing the smoke nuisance and also shows that the consumers of coal are realizing that their bills can be curtailed importantly by proper firing.

Considerable difficulty has been experienced in securing anything like general co-operation in suppressing the smoke evil in Pittsburgh. According to information from the Bureau of Mines this is due to the fact that coal is cheaper in Pittsburgh than at nearly any other point in the United States. Since this removes the important incentive for burning coal smokelessly, the average purchaser of coal is not impressed with the idea of going to any trouble to save a small percentage of the coal consumed. As a consequence the average cost of making steam in Pittsburgh is no lower than it is in the copper district of Michigan where coal is worth twice as much. Coal becomes sufficiently valuable at the Michigan copper mines to direct attention to its conservation. With careful firing little smoke is poured out into the atmosphere.

All urban communities are interested in keeping cities clean. Most consumers of coal are anxious to keep their fuel expenses at the lowest point possible. They are learning that firing a furnace can be done a right and a wrong way. The Bureau of Mines is responsible to no small extent for this changing tendency.

MR. LANE AND MR. PINCHOT

It will come as a surprise to many Westerners that Mr. Franklin K. Lane, Secretary of the Interior, has incurred the displeasure of Mr. Pinchot.

Possibly no man in times of peace has drawn to himself, in any large section of the country, more bitter animosities than has Mr. Pinchot in the Rocky Mountain States and Alaska. As Secretary of the Interior, Mr. Lane has also been severely censured by the West because of his apparent approval of the Pinchot so-called conservation policies.

In an open letter addressed to Mr. Lane Mr. Pinchot says:

> "Your plan to turn the natural resources of Alaska over to a bi-partisan political combination embodied in the Pittman Bill, now before Congress, which bill you have been diligently trying to get passed, if passed would open the way for a destruction of our whole system of National Conservation."

The Alaskan coal situation furnishes the most striking illustration of what Mr. Pinchot calls "our whole system of National conservation." In furtherance of this policy, the coal lands of Alaska were withdrawn from entry by President Roosevelt in the year 1906 "in aid of legislation." The legislation proposed was the establishment of a Federal leasing system and in order that this system might embrace all of Alaska's coal lands a campaign was entered upon, looking to the confiscation of the rights of Alaskan coal claimants who had invested their money in an effort to develop the coal mines in accordance with the then existing Land Office regulations. This was accomplished and the Alaska Coal Leasing Act has now been the law for two years. No leases have been granted and no coal has been mined under its provisions. Those who are familiar with coal mining operation have no hope that any substantial development will ever take place under its requirements.

It is believed that leases will be applied for by those who know how to make money, by selling stock, whether the mining of coal can become profitable under its provision or not.

Ten years of "our whole conservation policy" in Alaska has resulted in the abandonment of the work already in progress at the beginning of this period and the complete tying up of Alaska's coal resources.

Mr. Lane has undertaken to deal with a practical problem in a practical way. He has failed in the trust which Mr. Pinchot (?) conferred, and is advocating the home rule principle for Alaska control, a principle which is the bulwark of our government. If Mr. Lane can effectually destroy the policies which have thus hampered Alaska's development, he will win the enthusiastic approval of all Alaskans and the commendation of all other patriotic American citizens who have any knowledge of Alaskan conditions.

COAL INDUSTRY'S BIG PROBLEMS OUTLINED

What the coal industry needs is to sell its output at a price which leaves a profit after all the costs of operation, depreciation and exhaustion are provided for. This must be accomplished either by reducing the cost of production, reducing the cost of distribution, or by securing a better price in the market.

The competition created by the ability of coal operators to produce 50 per cent more coal than the markets can possibly consume, and the necessity of a large production (in order that the overhead charges may be reduced to the minimum) create a condition which necessarily destroys markets and will continue to do so until some comprehensive plan of co-operation can be made effective.

This leads to the conclusion that some form of combination between coal operators is absolutely essential to the profitable conduct of the business. Should this condition be brought about the coal industry must next face the possibility that a stronger and more compact organization, which already absorbs 75 per cent of the market price of the coal, would immediately demand a share of these profits, and judging from the past the share demanded would be 100 per cent.

A provision of the Clayton bill gives authority for combinations of organized labor which it forbids the operators. It would therefore seem desirable that this law should be so amended that the same authority which supervises the combinations of operators for the betterment of their business should also supervise the labor organizations, and permit them to act in combination only when its acts are not too greatly subversive of the public interest.

It would seem that a campaign should be inaugurated for any such additional authority to go to the Federal Trade Commission so as to permit it to supervise and control all organization whether of labor or capital, which undertakes by cooperative means to better its conditions.

It also seems that a campaign should be inaugurated to repeal that part of the Clayton bill which legalizes those acts of labor which otherwise would be a violation of the Sherman law. A requirement should be made for such a system of cost accounting as will show the exact condition of the coal mining industry.

A strengthening of the Federal Trade Commission is also very desirable.

If these things are accomplished it will even then be difficult for coal operators to act together in such a way as to put the business upon a sound financial basis.

Such interesting questions as these are to be discussed at the nineteenth annual convention to be held at Chicago, November 13-16.

COOPERATION MAKES EXACT STATISTICS POSSIBLE

Evidence is plentiful at the Geological Survey that the cordial cooperation given by the mine, smelter and quarry operators of the country, in enabling the Survey to compile a semi-annual review of the mining industries, is appreciated very highly.

The magnitude and present activities of the mining and quarrying industries are probably not yet fully appreciated by the public. The mining industry has suffered greatly in the past from the lack of publicity and even at present is receiving less publicity than any important industry in the country despite the spectacular features characterizing mining enterprises at this time.

There was a time when many mining and smelting companies objected very strenuously to any form of publicity. That this has changed almost entirely is shown by the cordial way in which mine and smelter operators contribute information to the United States Geological Survey. They now realize the advantage of having figures and facts go to the public through an impartial agency which gathers them intelligently and with scrupulous care.

COMPULSORY ARBITRATION

The distinction between civilized government and barbarism is largely a difference in the methods employed in the settlement of disputes.

In modern governments the rule is that those who undertake to settle their controversies by personal force, are regarded as criminals, and if convicted by the courts, are subject to punishment.

The exception to this rule has been the disputes between employer and employe, which subject to the requirements for the preservation of law and order, have been settled by a form of force almost as effective as the force of arms.

In some instances where this power has not been able to accomplish its purpose, violence has been resorted to.

When industrial conflicts concern only the parties involved and are carried on without violating the laws, it would seem that the public had no right to demand a different method of settlement; but when these disputes affect the general public more vitally than the contestants there would seem to be many reasons why the public interest justifies interference in behalf of the people as a whole.

The present railroad situation seems to point out more clearly than ever before the necessity of some form of adjudication of disputes between individuals which affect the public as a whole as well as the parties involved.

It would seem that our civilization is incomplete until it has provided for the settlement of group differences by rules similar to those which prevail in the adjudication of private disputes.

The state punishes the individual who by might or stealth undertakes to secure redress for his grievance. Disputes between groups of individuals are much more dangerous to the public peace and frequently concern the public at large in a much more vital manner than private disputes.

The public has a right to protect itself against the inconveniences and loss occasioned by a stoppage of traffic. The public has a right to be heard on the question of increased costs of transportation which, in the end, it must assume and pay. The cost of living is already burdensome. A considerable part of that cost is transportation. It is estimated that the produce for which the consumer pays one dollar nets the producer thirty-five cents, while sixty-five cents pays the cost of transportation and distribution. The public as a whole is entitled to be heard, and subject to the rights of humanity on the one side and property rights on the other, should absolutely control this and similar situations.

The public protects itself against lawlessness by establishing courts and court agencies through which crime may be prevented or punished. That same public has an equal right—more than that it is charged with the composite duty—to protect its individual parts against injustice and oppression, both of which are involved in every great industrial contest.

PATENT LAWS BAD; INVENTORS SUFFER

Various laws on the statute books are urgently in need of revision. This applies to the mining law perhaps more than to any other, but the laws governing the granting of patents well may be placed in the same category. This has been shown very clearly as a result of the negotiations surrounding the patenting of the Rittman process for making gasoline. While it may be that Mr. Rittman's process was peculiarly a target for rival claimants due to the fact that his discovery is being patented by the government, the fact remains that despite every effort to settle the controversies which have arisen in regard to distilling methods, nearly a year has passed and the matter is in a worse jumble than ever.

LEGISLATION NECESSARY TO HELP JOPLIN

National legislation undoubtedly will be required to stabilize conditions in the Joplin zinc producing district. It is necessary to the welfare of this mining region to have the right to form such combinations as will enable the marketing of the product in a business-like way. As it is, the producers are forced to accept any offer which may be made by one of a number of purchasers acting under a gentlemen's agreement. It is also necessary to the success of the Joplin district that a tariff be levied against the importation of zinc ores. This duty must be sufficient to cover the difference in cost of production here and abroad as determined by the relative labor cost.

WYOMING ONLY STATE NOT USING FOUNDRY COKE

Coke for foundry purposes was consumed in every State except Wyoming, in 1915, the Geological Survey has ascertained. The principal use of foundry coke is in the cupola for melting pig iron and scrap for castings, although it is used to a small extent for melting the non-ferrous metals.

Inspect Safety First Train

Salt Lake City, August 25.—The government "Safety First" train was at Salt Lake City August 19 to 21, remaining open to the public from 1 to 9 p. m., August 19 and 21. Eight thousand persons visited the train.

COLORADO AND UTAH ARE DESTINED TO BECOME GREAT CENTERS OF OIL PRODUCTION

Hydrocarbon Shales Now Being Carefully Iinvestigated by United States Geological Survey—Work in Field During Past Month Develops Fact that Shales Cover Much Greater Area Than Was Supposed

The field investigation and mapping of the hydrocarbon shales in northeastern Utah, to which reference was made in the last issue of the JOURNAL (page 358), have been carried westward by D. E. Winchester of the Geological Survey in charge of the work. He reports the existence of oil shale deposits over a considerable area in northeastern Utah. Mr. Winchester's work for the Geological Survey promises to increase materially the estimates made previously by the Survey as to the oil and gasoline reserves represented by these invaluable deposits. According to the published survey there is estimated to be about 20,000,000,000 barrels of oil, from which 2,000,000,000 barrels of gasoline can be extracted (by the old methods), obtainable from the shale beds 3 feet or more in thickness and which run 25 gallons or more to the ton in Northwestern Colorado alone.

These hydro-carbon deposits are not deposits of shale which have been saturated or impregnated with oil, but are sedimentary deposits made up of organic detrital material somewhat similar in origin and nature to cannel coals. The oil is obtained by destructive distillation, roasting, which breaks up the organic combination in the shale. The volatile matter is driven off as gas, a large portion of which on cooling condenses to form oil similar to the lower grades of petroleum obtainee from the Gulf Coast and the California fields. Some of the shale deposits will yield over 50 gallons of oil to the ton of shale.

According to this calculation, Colorado alone appears to contain in these oil shales more than twice as much petroleum as, according to the current estimate, now remains both in the discovered and in the possible oil pools of the United States. The latest estimate, that furnished by the Survey for the use of the Secretary of the Interior in his reply to a Senate resolution (Senate document 310—64th Congress, Second Session), names 7,629,000,000 barrels as the reserve of oil remaining in the oil fields of the United States. It must be remembered, however, that such estimates are, after all, only mere scientific guesses based upon the best and most comprehensive information available and are subject to great error on account of the vague and indeterminate elements conditioning the calculation.

The importance of the oil resources locked up in the hydro-carbon shales of northwestern Colorado and northeastern Utah will be better realized when it is remembered that the total production of petroleum in the United States from the beginning of the industry to date amounts to something over 3,500,000,000 barrels. There is hardly room for doubt that this invaluable and relatively inexhaustible deposit will be utilized sooner or later, possibly very soon, it may be almost immediately. Colorado and Utah will perhaps loom up eventually as great centers of oil production in the United States.

Another important feature with regard to the oil shale deposits is the fact that they have considerable contents of nitrate. One of the by-products of the distillation of these shales will be nitrate. In view of the desirability of the United States having a supply of nitrates within its own borders, the by-product development will be second only in importance to the petroleum output.

MATANUSKA COAL BROUGHT TO TIDEWATER BY RAILROAD

The Government's Alaskan railroad is now carrying coal from the famous Matanuska coal fields, to tidewater at Anchorage, a distance of 71 miles, says a statement from Secretary Lane. The first coal was loaded into a train of cars on Wednesday afternoon, August 16, and was taken from the Doherty mine at Moose Creek.

"The importance of this event was evidently appreciated by the pioneers in the Territory," continues Mr. Lane, "for there was a large crowd of men, women and children on the scene when the loading of the coal from the bunkers to the cars was begun. A special train, that had been chartered by the Anchorage Chamber of Commerce, carried an enthusiastic party of citizens from that city and vicinity. Chairman William C. Edes and Lieut. Mears, of the Alaskan Engineering Commission, which is in charge of the construction of the railroad, were also in attendance, as was Bishop Rowe, of Alaska.

"The honor of dumping the first carload of coal from the bunkers to the train, was enjoyed by Miss Babe White, of Anchorage, who also has the distinction of having driven the first spike on the railroad. The incident was accompanied by the enthusiastic and vociferous cheering of the assembled multitude. No untoward incident marred the event, and there was a general expression of satisfaction that the Government's railroad had so successfully entered the coal fields at a much earlier date than had been expected.

"The opening of these coal fields is regarded as a most important valuable benefit to both Alaska and the Pacific Northwest. It means cheaper fuel for that general country, and it is confidently predicted that it will be followed by new industrial and mining expansion."

Latest Mining Patents

Apparatus for use in connection with the distillation of petroleum and products therefrom. No. 1,192,889. This invention is by John L. Gray, of Webster Groves, Mo.

The object of the invention is to produce, from one heating of the crude material, any desired number of the constituents of the crude material as isolated segregations, having as closely as possible fixed densities and boiling points. To this end the condenser of this invention comprises a sufficient number of units or sections to condense all the material it is desired to separate. There may be as many products as there are sections. Each product may be taken from the section in which it is condensed, or but few products may be taken from the condenser. These units are preferably vertically arranged, and through them the compound vapor will consecutively flow. Each unit embodies an air cooled tubular condenser, a chamber beneath it and a condensate collecting trough in the chamber into which the condensate formed in the tubes will fall.

Method of extracting gold. No. 1,193,197. This invention is by Albert W. Smith, of Cleveland, Ohio.

The object of the invention is to provide a process whereby the formation of the deleterious compounds may be prevented without directly affecting in any way the action of the cyanide, the greater part of the oxygen for the reaction of the cyanide with the gold being preferably secured by agitating the solution in air as heretofore.

Sealing Plug for Oil Wells. No. 1,194,764. This invention is by David C. Miller, of Tulsa, Okla.

This invention relates to a sealing plug for oil wells and more particularly to a device of this character which may be lowered into the oil well casing or tubing, whereby the bottom of the casing or tubing may be sealed and closed for preventing the inlet of water in wells which have penetrated to such a depth that water tends to enter the well and thereby prevent the proper working of the well.

Ore Concentrator. No. 1,194,477. This invention is by Louis David Chevalier and Henry Charles Reche, of Dubuque, Iowa.

This invention relates to improvements in apparatus for concentrating ore and the object of the improvement is to furnish a device which shall effectively separate the heavier from the lighter ingredients of comminuted ore by the action of mechanical agitation thereof accompanied by the differential movements imparted thereto caused by the employment of air currents moving in various directions. The apparatus may be used to separate any heavy components from lighter materials in a mixture, such as coal from stony particles, or the like, as well as ore.

Method of Mining Coal. No. 1,194,298. This invention is by Harry A. Kuhn, of Pittsburgh, Pa.

This invention relates to a method of mining coal. The object of the invention is to provide a method of mining coal by means of which the coal, after it has been undercut and shot, may be readily and quickly removed without involving the risk of loss of life, and at the same time dispensing with the digging of the coal by means of picks, as in the method now commonly employed. To this end the invention consists in making a cut or undercut in the solid wall of coal and expanding the coal along its lines of cleavage, substantially filling the space thus provided by the cut or undercut, the coal settling down where an undercut is made on the floor formed by the undercut, or swelling into the cut wherever made, finally undermining the coal along the line of the original cut, and at the same time conveying it to the point of loading.

Process of Extracting Gasoline from Natural Gas. No. 1,195,158. This invention is by Joseph P. Foucart, of Muskogee, Okla.

This invention relates to the extraction of gasoline from natural gas from oil wells, commonly known as "casing head gas," said gas being more or less saturated with gasoline particles and heavy hydrocarbons which under prevailing practices are separated from the gas by condensation under low temperatures and high pressure, thereby producing a high gravity gasoline. This is subsequently converted into commercial gasoline by mixing the same with the residue of refineries or low gravity naphtha. This improvement contemplates the extraction of commercial gasoline from the aforesaid casing head gas under conditions of high temperature and comparatively low pressure and by proper control of said conditions a gasoline of any desired gravity within certain limits may be obtained, whereby subsequent treatment by reduction or mixture with low grade gasoline or naphtha is dispensed with. The product under this process may be used for all industrial, domestic and other purposes as it comes from the plant, thereby saving the expense of transportation to reducing plants for further treatment as is now generally the case.

Recovery of Zinc. No. 1,193,680. This invention is by Charles H. Fulton, of Cleveland, Ohio, assignor to David B. Jones, of Chicago, Ill.

The primary object of the invention is the recovery of an increased percentage of the zinc content of the ore, either in the form of spelter or in the form of zinc oxid, although other advantages flow from this invention. The object and advantages of this invention are obtained by mixing the ore and the reduction agent and a binding material in certain proportions, forming the mixture into briquets under a high pressure, subjecting the briquets to a preliminary heating and drying operation under certain prescribed conditions and subsequently subjecting them to treatment in a distillation furnace for the recovery of their zinc content either in the form of spelter or zinc oxid as may be desired.

AMERICAN INSTITUTE OF MINING ENGINEERS TO MEET IN ARIZONA

The American Institute of Mining Engineers will meet in Arizona the week of September 18. Sessions will be held in the principal mining centers of the state, the members traveling between the various points by special train and automobile.

Some indications of the importance of this meeting to mining engineers in various sections of the country is shown by the fact that a special train has been arranged for to carry eastern members from New York City on September 14. Other members and their guests will join the party at various points en route and at El Paso, Tex., the western section of the convening members, starting from Los Angeles, Cal., will meet the train and continue to Arizona.

The company plants that will be visited are as follows: At Hurley, the mines and works of the Chino Copper Co.; at Bisbee and Douglas, the mines and works of Copper Queen Consolidated Mining Co., Calumet and Arizona Copper Co., and Shattuck Copper Co., at the Globe district, mines and works of Inspiration Consolidated Copper Co., Miami Copper Co., Old Dominion Copper Mining and Smelting Co., together with the new works of the International Smelting Co.

The institute now comprises more than 5,600 members.

RAILROAD FOR OATMAN DISTRICT PLANNED, IT IS SAID

It is reported in Washington on good authority that the Atchison, Topeka & Santa Fe Railroad is contemplating seriously the building of a line from Topock to Oatman, Ariz. The advantages of railroad transportation to the Tom Reed-Gold Road district will have an important bearing on the development in that region.

BUREAU OF MINES DOES GOOD WORK AT EXPLOSION

By hurrying a number of its experts to Cleveland immediately following the explosion in the tunnel being run under the lake at that point, the Bureau of Mines was able to do efficient safety work and offer valuable suggestions for the prevention of similar accidents. It is the opinion of George S. Rice, chief mining engineer of the Bureau of Mines, who personally visited the scene of the explosion, that the gas which caused the explosion came from a pocket in the glacial clay in which the tunnel is being driven. He recognizes, however, the possibility that the explosion may have been caused by natural gas which had worked its way up into the clay. Natural gas has been found under the city of Cleveland. It is regarded as more probable, however, that the gas came from the decaying of carbonaceous material in the glacial matter.

An interesting feature of the investigation was the development that the men working on the tunnel believed they could smell gas and were relying on their olfactory nerves to warn them of the presence of dangerous gases. They were very much surprised to learn that the more dangerous mine gases have no odor.

The Bureau experts were not able to ascertain exactly the cause of the explosion but indications point to the fact that the gas was ignited by a spark from a motor which was in operation near the face of the tunnel. There is a possibility that the explosion may have been caused by the breaking of an incandescent lamp as a broken lamp was found near the center of the explosion.

As a result of the investigation the Bureau of Mines recommended to the city officials that "permissible" electric cap and hand lamps be used just as would be done in gaseous coal mines and that all electric wires be removed in that part of the tunnel which would be exposed to sudden bursts of gas, that is, between the air lock end the face of the tunnel. The air lock, behind which 32 pounds pressure per square inch was maintained, making ordinary ventilating methods difficult to use. At the suggestion of the Bureau of Mines, better ventilation was provided by the installation of an overhead gas-collecting funnel and return pipe running through the air-lock and up the shaft to the open air. It was also recommended that compressed air be used instead of electricity for haulage engines and other machinery.

The Secretary of War, whose home is in Cleveland, has taken an active personal interest in the investigation and at his request the Bureau of Mines has released one of its most efficient gas inspectors, who has been employed in the tunnel. The driving of the tunnel has been resumed. The accident resulted in the death of twenty-two men in the original accident and attempted rescue work, before the arrival of the bureau crews with oxygen mine rescue apparatus.

BUREAU OF MINES SHOULD PASS UPON ALL GOVERNMENT FUEL, EXPERTS DECLARE

Committee on Mines and Mining Considers Dr. Foster's Bill Which is Intended to Bring About Greater Efficiency in Purchases of Coal and Other Fuels— Van. H. Manning Testifies

The imperative need of more intelligent purchases of coal for government use was set forth by Van H. Manning, Director of the Bureau of Mines, before the Committee on Mines and Mining. The hearing was on H. R. 10930, the bill introduced by the chairman of the committee, Dr. Martin D. Foster. It provides for the uniform selection and purchase of fuel. Following is a portion of the testimony of Mr. Manning before the committee:

The annual coal purchases of the Government amount to between $7,000,000 and $8,000,000. This fuel is selected and used sometimes in the most satisfactory manner, but frequently in ways inefficient and wasteful. The supervision of its use is sometimes expert, but is often far from satisfactory, so that engineers competent to judge are of the opinion that the practices of the Government in the economical use of its fuel are open to improvements of the same order of magnitude as have been realized by many large users of fuel when centralized, persistent effort has been made to reduce fuel costs. A saving as moderate as 10 per cent, which is believed to be well within a reasonable expectation, indicates the magnitude of the sum involved. There is at present waste in the selection of fuels, waste due to inefficient design of equipment and waste in the manipulation of fires. There is a lack of expert instruction given to the man firing the fuel, a frequent lack of information by plant managers as to what other plants are attaining, and a lack of knowledge of standards by which to measure actual performance.

The Navy Department is the largest purchaser of coal, its yearly requirements being approximately 1,000,000 tons, costing approximately $3,000,000, of which about 750,000 tons are for delivery to ships, the balance being required at navy yards, stations and other land establishments in the United States.

The next largest is the War Department, in which the Office of the Quartermaster General of the Army purchases each year for use at Army posts in the United States approximately 265,000 tons of coal, costing about $1,500,000. Many of these posts are not using the most economical fuels available, some purchasing anthracite coal, for instance at high prices when bituminous coal of good quality is available. Selecting about 25 posts out of 100, or so, of the larger ones, a study indicates that by a change from high-priced anthracite to bituminous coal, a saving of at least $86,000 per year could be realized. This is but a small part of the total saving that could be made by all of the posts by the selection of the most economical fuels following a careful study of the fuels available in different parts of the country and of the adaptation of the furnace equipment at the posts to the use of the cheaper local fuels.

Many of the posts in the West are located on land-grant railroads and by the intelligent selection of fuels at many of the posts as regards the most advantageous land-grant freight rates that could be obtained, a further saving of many thousands of dollars per year could be effected, it being estimated that had the coal requirements of the posts and transports in the San Francisco district for the current fiscal year been purchased for delivery at Portland, Ore., and then shipped to distination via land-grant roads, that a saving of approximately $40,000 could have been made.

During the present fiscal year, the Indian Office, which purchases annually approximately 38,000 tons of bituminous and 5,000 tons of anthracite coal, has been giving consideration to reducing fuel costs. High-priced anthracite coals are being replaced by suitable or available bituminous coals.

The Bureau of Mines has been able to attack the fuel problems of the Government in but a very small way, because of its restricted authority and limited funds available. It has been restricted practically to making investigations only when so requested by the other bureaus or departments of the service.

The Bureau of Mines has, however, promulgated the purchase of coal on the quality or specification basis. During the present fiscal year the total estimated amount of coal so purchased and to be paid for on the basis of analyses of samples by the Bureau of Mines is 1,340,000 tons, costing approximately $4,070,000. As indicating the advantage of such a method of purchasing coal, the War Department reported that in the fiscal year 1911-12 a saving was realized of $27,361 on coal contracts amounting to 265,372 tons, costing at contract prices $1,582,721.

The greatest saving that has come to the attention of the Bureau of Mines as a result of the use of the specification method was that obtained on contracts of the Panama Railroad Co. during the fiscal years 1910-11 and 1911-12. A net saving of $73,510 resulted from deductions in price account of the delivery by the contractor of coal lower in quality than guaranteed. This saving was on contracts amounting to approximately 1,142,800 tons, costing $2,963,000.

The Bureau of Mines has been able to make but a few investigations of the fuel problems in some of the local plants in the District of Columbia, such investigations being made upon specific requests, and the following illustrates the advantages that have resulted.

A saving of approximately 12,200, or 22 per cent per year, in the Government Printing Office plant has been realized as the result of a change to bituminous and a steam size of anthracite from anthracite egg coal, which formerly cost about $53,500 per year.

A saving of approximately $2,700, or 18 per cent, per year, in the Land Office plant has been realized as the result of a change to bituminous from anthracite coal, which formerly cost about $15,000 per year.

A saving of approximately $19,000, or 59 per cent per year, in the State, War, and Navy Building plant resulted from the substitution of bituminous and anthracite buckwheat for anthracite furnace coal, which formerly cost about $32,000 per year, and from the centralization of heating and power in one plant.

Tests recently made at the Bryant Street pumping station indicate that a saving can be made of about $2,400 per year in the more efficient utilization of the fuel.

While the late Director of the Bureau of Mines was recuperating at Fort Bayard, N. Mex., he became acquainted with an engineer from the Quartermaster General's Office, who was detailed at Fort Bayard for the purpose of determining the reasons for the excessive fuel consumption in the power plant and for heating purposes. It appears that before the engineer arrived, the plant was smoking almost constantly, but the experienced engineer was able to instruct the firemen in the proper use of the coal, without making any change in the equipment, with the result that practically all of the smoke was eliminated and the evaporation of water per pound of coal was increased almost 100 per cent. Within a short time, however, after this engineer visited the fort, the methods of handling the coal had again become lax and the power plant belched forth smoke about as before, indicating the necessity of constant supervision of the operation of Government power plants. Further, it was determined that at the time of the engineer's visit, bituminous coal costing about $7.20 per ton could be satisfactorily used for heating purposes in place of anthracite coal costing at that time over $13 per ton, but so far as is known, the cheaper fuel has not been utilized.

So far as the Bureau of Mines is informed the War Department has only one engineer who has made a special study of the selection, handling, and use of fuels, his time being largely taken up with the matter of power plant design and he is able to give only a part of his time to the question of the economical selection and use of fuel. It is readily apparent, therefore, that this important question of the study of the selection and use of coal by the War Department cannot be efficiently and adequately prosecuted under the present conditions.

To obtain the best results in the selection and utilization of fuel for the various departments the investigations should be under one office, so that a universal supervision of Government fuel requirements would obtain. The War Department, Treasury Department, Navy Department, and others have engineers who are all endeavoring to cover, in more or less degree, work of similar character, and their lines of travel throughout the United States frequently cross and recross.

Nearly every branch of the Federal Government is at the present time buying fuel for New York Harbor delivery, and each office is working entirely independent of the other. By centralizing such purchases a material saving to the Government would undoubtedly result.

Buyers of Manganese Ores

The principal purchasers of manganese ores are as follows: N. A. Adler, Batesville, Ark.; Alleghany Ore & Iron Co., Iron Gate, Va.; American Carbon & Battery Co., E. St. Louis, Ill.; American Manganese Mfg. Co., Dunbar, Pa.; American Smelting & Refining Co., Murray, Utah; American Steel Foundries, Pittsburgh, Pa.; Burney & Smith, New York, N. Y.; Carnegie Steel Co., Pittsburgh, Pa.; Delaware River Steel Co., Chester, Pa.; Eureka Manganese Co., Birmingham, Ala.; Robert Gilchrist, Elizabethtown, N. J.; Harshaw, Fuller & Goodwin Co., Cleveland, Ohio; Hickman Williams & Co., St. Louis, Mo.; Illinois Glass Co., Alton, Ill.; Illinois Pacific Glass Co., San Francisco, Cal.; J. S. Lawson & Bro., Inc., 80 Maiden Lane, N. Y.; Manhattan Electrical Supply Co., New York, N. Y.; Napier Iron Works, Napier, Tenn.; National Alloys Co., Philadelphia, Pa.; National Paint & Manganese Co., Lynchburg, Va.; Noble Electric Steel Co., Heroult, Cal.; Pulaski Iron Co., Pulaski, Va.; Sloss Sheffield Steel & Iron Co., Birmingham, Ala.; U. S. Steel Corporation, Pittsburgh, Pa.; U. S. Steel Corporation, South Chicago, Ill.; U. S. Steel Corporation, Birmingham, Ala.

PROMONTORY DISTRICT OF UTAH SUBJECT OF REPORT

A spectacular occurrence in mining was the discovery of important copper property in the Promontory region of Utah. A deposit of great richness, which cropped on the surface, lay until recently in a frequently traversed region without discovery. It is only two miles from the railroad. When work was started on it profits were taken out from the grass roots.

The men who undertook the work began with no capital and during the first year the company paid $100,000.00 in dividends.

Some interesting facts with regard to the geology of the Promotory district have been brought out by a report by the Geological Survey written by B. S. Butler and V. C. Heikes. Mr. Butler specializes on copper and is regarded as one of the best posted men in the United States on this metal. Mr. Heikes is in charge of precious metals and semi-precious metals of the states of Utah, Arizona, Nevada and Montana.

While the data on the Promontory district was compiled during a hurried visit there is increasing demand for just such information. It doubtless would be years before the importance of such a district would justify a detailed examination. Such a report as just has been issued, however, required little time and expense and still is of great service. An increasing number of such reports are to be issued it is understood.

As to the history of production in the Promontory district the report referred to says:

Prospecting in the range up to the time of visit had been largely confined to two localities, both near the southwest side of the promontory. There has been some prospecting of copper deposits in the quartzite series on the west side of the promontory about 1½ miles northwest of Saline over a period of several years. In 1907 14 tons of hand-sorted ore, averaging 3.85 per cent of copper and 1 ounce of silver to the ton, was shipped. The present activity is confined largely to the zinc-lead deposits. The history of these deposits is given by S. S. Arentz as follows:

For several years previous to 1915 a coterie of Ogden men, headed by Mr. James Wortherspoon, Lorenzo Farr, John Farr, and Mr. Carlson, held two groups of placer claims covering a bed of marbleized limestone, and also a large portion of what is now the Lake View Mining Co.'s property. This placer property was held by location over a period of some five years; the amount of work done was almost negligible. December, 1914, several men, headed by L. F. Farr, were employed to work on this placer property on the marble outcrop, about 1 mile north of the Judge Henderson wheat field. During noons and Sundays the workmen walked up the wash to the limestone beds outcropping above. Bowlders of lead-zinc carbonate were discovered in the talus and traced to the outcrop of ore in place found at the top of the 100-foot bed of limestone, forming the so-called middle bed in contact with shale. Four locations were then made.

The average of the ore is said to be as follows:

Lead	7.7
Iron	1.1
Silver	.2
Gold	Trace
Zinc	32.75
Sulphur	.2
Moisture	1.9
Insoluble	16.0

ZINC AND LEAD DEPOSITS

Prospecting of zinc and lead deposits at the time of visit had been confined almost entirely to the "middle" limestone bed. As noted in the discussion of the geology, this is a limestone bed 50 to 75 feet in thickness included in members composed prevailingly of shale. The ores have been formed by replacement of this limestone near the north-south fissures. The largest deposits thus far disclosed occur just beneath the overlying shale, though developments have shown that considerable mineralization has taken place at lower horizons in the ore-bearing limestone. The ores are entirely oxidized, consisting of zinc and lead carbonates and a little hydrous iron oxide and manganese oxide. The gangue consists mainly of unreplaced limestone with some quartz.

As the writers' observations were confined to very shallow developments, it is not possible to make any generalizations concerning the relations of the ores. The carbonate ores were undoubtedly derived from the alteration of sulphides, though no sulphide was observed.

It has been found a pretty general rule that in the oxidation of mixed lead and zinc sulphides in limestone the oxidized lead ores occupy essentially the position of the original sulphides and the zinc ores have formed beneath the original sulphide bodies. The zinc sulphate produced by the oxidation of the sulphides has passed into the underlying limestone, with which it has reacted to form the zinc carbonate. The chemistry of this process has been discussed in the papers cited and need not be set forth here.

In the Promontory district, so far as developments show, zinc is far more abundant than lead, and it is possible that this was true in the sulphide bodies. The relation of the zinc and lead ores in some places corresponds to that found in other districts, namely, the zinc lies below the lead; but there are other places where this does not appear to be the case. A determination of the general relations must await further developments. Mr. Arentz has pointed out that from the crests of the spurs, through which the ore bed passes, toward the canyon bottoms there is a progressive decrease in the content of zinc and an increase in lead.

Prospecting has been carried on along the outcrop of the "middle bed" for a distance of about 4,5000 feet, and lodes of ore are shown in numerous openings. In the development of the property the managers seem to have followed the conservative policy of determining the amount and character of the mineralization along the outcrop before beginning extensive developments at depth, and at the time of visit the ore zone had nowhere been exposed more than a few feet below the surface. Sufficient data concerning the mineralization had been obtained, however, to warrant the planning of deeper development work. The region is one of considerable relief and suited to the development of the ore bed for several hundred feet below its highest outcrop by means of tunnels. Practically no work has been done on the lower limestone, though it is said to contain as much as 3½ per cent of zinc on the outcrop.

COPPER DEPOSITS

The copper prospects of the Promontory district are about 1½ miles northwest of Saline station The deposits crop out on the crest of a ridge near the shore of the lake. The country rock is the quartzite near the base of the exposed sedimentary rocks of the south end of the range. The beds at this point strike N. 45°-50° E. and dip 16°-20° SE. The ore is disseminated in the quartzite. The primary mineralization formed chalcopyrite and possibly bornite, but at the surface the sulphides have been altered to carbonates.

The developments consist of two shafts about 200 yards apart, sunk from the crest of the ridge. One of these has a depth of about 50 feet, the other of 120 feet. At a lower point an inclined shaft was sunk on a westerly pitch nearly at right angles to the dip of the beds to a depth of 80 feet. Near the same point a tunnel has been driven eastward for about 100 feet. At a point near the shore of Great Salt Lake and about 200 feet vertically below this tunnel another tunnel has been driven eastward for 452 feet. This was projected to intersect the downward extension of the ledge that crops out on the ridge.

Some mineralized rock was observed in the prospect openings, and it is said that more valuable ore was encountered at some points which were not accessible at the time of visit. The ore shipped was obtained from large blocks of mineralized quartzite at the surface. These blocks measured from 15 to 50 feet in thickness.

Invitation Extended to Institute

Through the kindness of the officials of the American Institute of Mining Engineers, members of that body will be advised of the invitation extended to them by the American Mining Congress to attend the 19th annual convention which is to be held in Chicago, November 13 to 16

GOVERNMENT SPECIALISTS HAVE AN EXPERIENCE MEETING

In a conference participated in by thirty-five mining engineers, mine rescue and first aid men of the Bureau of Mines, at Pittsburgh, from August 15 to August 26, much general information was brought out by a general interchange of views. Each one of those called to the conference outlined the work he has been handling for the past year. Each man had carefully prepared for the occasion and was able to give a concise statement of his work setting forth the more important developments as well as the problems which have not been solved satisfactorily. George S. Rice, chief mining engineer of the Bureau of Mines and H. M. Wolflin, engineer in charge of the mine safety work, presided. After each paper general discussion was held.

BUREAU OF MINES TO AID WITH CALIFORNIA FIELD MEET

The Second Annual California Field Meet for Miners will be held September 6 under the auspices of the California Metal Producers' Association. This organization will be assisted by the Bureau of Mines and the Industrial Accident Commission of California. Edward Higgins will represent the Bureau of Mines at the meet.

Robert I. Kerr, secretary of the Metal Producers' Association, is chairman of the committee having charge of the meet. John R. Brownwell, superintendent of Safety of the California Industrial Accident Commission, is the other director of the meet.

COMMENTS ON ARIZONA'S RISE AS COPPER PRODUCING STATE

In connection with the announcement that the next meeting of the American Institute of Mining Engineers is to be held in Arizona, an official of the organization makes the following statement:

"A few years ago Arizona stood third in the copper-producing districts of the United States. Since that time, with the development of porphyry mines, the output has gone up with great rapidity until it not only is the leading district, but its output at the present time is at the rate of nearly double the Montana output, which now stands second in the list."

To Confer on Oil Development

A conference with regard to the development of fuel oil for the Navy will be held September 10, between Director Manning of the Bureau of Mines, William A. Williams, petroleum technologist of the Bureau and Dr. D. T. Day, a consulting petroleum expert of the Bureau, with the Fuel Oil Board of the Navy Department.

TWELVE WESTERN STATES CONTAIN MORE THAN 250,000,000 ACRES OF PUBLIC LAND

Nevada With 55,375,077 Acres, Leads Other States—In Colorado Over 2,500,000 Acres Were Taken Up During Last Fiscal Year—California Has Over 20,000,000 Acres of Vacant Land

Uncle Sam still has considerable land to give to the enterprising citizen, man or woman, who wishes to establish a home. Secretary of the Interior Lane announces that more than a quarter of a billion acres of land remain in the public domain, according to official figures, just compiled by the General Land Office. These acres are located in twenty-five different states, extending from California to Michigan, from Florida to Washington. All but 2,290,000 acres of it is is in the Far West, with Nevada containing the highest acreage, 55,375,077. An even dozen of the extreme western states alone hold more than 250,000,000 acres. The exact amount of land that is unreserved and unappropriated, according to the official figures, is 254,945,589 acres. Of this amount, approximately 92,000,000 acres are unsurveyed.

Missouri reports the least area of vacant land, having but 952 acres, which are scattered over 16 counties. Alabama has 42,680 acres in 51 counties; Florida 135,237 acres in 45 counties, Mississippi 30,374 acres in 58 counties, and Louisiana 44,804 acres in 57 counties.

In 52 counties of Michigan may be found 90,540 acres, while 30 counties in Wisconsin report 5,872 acres.

Of the Pacific States, California has 20,025,999 acres of vacant land; Oregon 15,337,809, and Washington, 1,132,571.

Large areas of vacant land are reported in the Southwestern States, as follows: Arizona, 23,597,219; Nevada, 55,375,077; New Mexico, 26,338,379; Utah, 32,968,837.

The land in the Dakotas is rapidly passing into private ownership, only 2,382,588 acres of vacant land being reported in South Dakota, and 381,199 acres in North Dakota.

Of the Northwestern States, Idaho contains 15,510,561 acres of vacant land, of which 6,679,071 acres are unsurveyed; Montana, 16,649,725 acres with 7,420,071 unsurveyed; and Wyoming 28,528,192 acres with 1,960,752 acres unsurveyed.

Kansas' vacant area is reported as 56,018 acres, while Nebraska contains 146,256 acres.

In Colorado, over two and a quarter million acres were appropriated during the last fiscal year, leaving 14,908,127 acres now vacant. Of this area over 2,000,000 acres are unsurveyed.

The total area of unappropriated land, surveyed and unsurveyed, in the twenty-five public-land states, is reported as follows:

Alabama	42,680
Arizona	23,597,219
Arkansas	402,219
California	20,025,999
Colorado	14,908,127
Florida	135,237
Idaho	15,510,561
Kansas	56,018
Louisiana	44,804
Michigan	90,540
Minnesota	798,804
Mississippi	30,374
Missouri	952
Montana	16,649,725
Nebraska	146,256
Nevada	55,375,077
New Mexico	26,338,379
North Dakota	381,199
Oklahoma	33,250
Oregon	15,337,809
South Dakota	2,382,588
Utah	32,968,837
Washington	1,132,571
Wisconsin	5,872
Wyoming	28,528,492
Total	254,945,589

GLOW ON FACE AND HANDS OF NIGHT WATCHES EXPLAINED

The compounds used on the faces and hands of radium or night watches, now offered on the market, are of two kinds: (1) a mixture of artificial hexagonal zinc sulphide containing a very minute quantity of a radium salt, and (2) a mixture of calcium sulphide and other sulphides.

The radium preparations are much the better and owe their light-giving properties to the fact that artificial hexagonal zinc sulphide glows when bombarded by the alpha radiations given off by the radium. The alpha radiations consist of helium atoms. The radium preparations can be told from the sulphide preparations by examining in the dark with a lens. If the preparation contain radium the dancing light made by the striking of the helium atoms on the zinc sulphide is plainly visible, but the light due to calcium sulphide and other phosphorescent substances is quiet and continuous.

The foregoing explanation of this phenomenon was made by Frank L. Hess of the U. S. Geological Survey.

BEGINNING OF LABOR SHORTAGE IN COAL FIELDS SHOWN BY STATISTICS

In 1915 There Was a Decided Increase in Amount of Coal Mined, But the Number of Workingmen Decreased—Number of Active Days Also Shows Increase—Mines Operate Average of 203 Days

Statistics of coal production in 1915 recently compiled by the Geological Survey show that the bituminous coal mines of the United States were operated for an average of 203 days in 1915, and that they employed 557,456 men. Similar data for Pennsylvania also are given in the table included in the statement.

The Survey also has made an estimate of bituminous coal production during the first six months of 1916. No estimate of the output in separate states in the same period has been made, however, and no data are available covering the number of men employed or the number of days they worked during the first half of the present year. Such data will not be available until the reports of the year's operations are received by the Survey after the close of the calendar year.

The survey's report on coal in 1915 contains data with regard to the men employed, days worked, and the average output, in tons, per man per day and per year. These statistics will show the relation between the number of employes and the annual output. The average annual output per employe is, perhaps, the best index of the labor supply, and depends upon the daily rate and upon the number of active days. As shown the daily rate has exhibited a steady upward tendency, but as it is not possible to change this rate greatly within any short period, record outputs are obtained by increasing the number of men and by working the mines a greater number of days. The average number of men engaged in mining bituminous coal has, with a few slight exceptions, shown increase in each succeeding year from 1900 to 1914, and the average number of days the men worked has varied up or down with the increase or decrease in the total production. The record of 1915, however, presents a striking exception to the general tendency, for although there was (compared with 1914) an increase in the total output, accompanied by a greater number of active days, the number of employes decreased notably. When considered in connection with the statistics of previous years, this decrease is seen to be abnormal and indicates the beginning at least of a labor shortage.

As stated in the mid-year review there is every reason to believe that the output of coal in 1916 will exceed the previous records, and the final figures (when available) covering the days operated and men employed, will undoubtedly show a large increase in the average number of days, with possibly no very great difference in the number of men employed, although with regard to this the Survey has not precise information. It will be noted that approximately 557,000 men produced more than 442,000,000 tons of bituminous coal in 203 days, in 1915, or about 2,180,000 tons per day. The same number of men working at the same rate would have worked 120 days to produce the 261.000,000 tons of coal which it has been estimated were mined during the first six months of 1916. If the rate of production in the last half of 1916 is the same as in the first half, more than 520,000,000 tons of coal will have been produced, and if the same number of men are engaged in this production as were employed in 1915, they will have worked but 240 days out of the 365 days in the year. This figure does not appear high, when compared with 234 days in 1907, and 232 days in 1913, in the bituminous fields, or with 246 days in 1911, 257 in 1912, or 245 in 1914, in the anthracite region. In fact, some of the individual states show even higher records. For instance, in 1913 the bituminous mines in Pennsylvania operated on an average of 267 days; those of Virginia, 280 days, and those of Alabama, 255 days.

COAL AN IMPORTANT BAROMETER OF BUSINESS

Aside from its use as domestic fuel, coal enters indirectly into the industrial life of the nation. Mechanical power and heat are fundamental necessities of industry, and coal is the principal source of heat and power. It is, therefore, to be expected that any tendency either of progress or retrogression, in business, will be reflected in the production of coal. Attention to this point is called by C. E. Lesher, Coal Statistician of the Geological Survey.

Marquardt Returns From China

The staff of the petroleum division of the associated geological engineers has recently been augmented by engaging Ernest Marquardt for service in Oklahoma. Mr. Marquardt has lately returned from China, where he was attached to the geological staff of F. G. Clapp. He remained in China after the return home of the latter a year ago.

CAR SUPPLY HAD DISTINCT EFFECT ON COAL INDUSTRY DURING 1915

With Market Always Ready to Absorb Their Product Oil and Gas Miners Enjoy Advantage Over Producers of Bituminous Coal. Their Success Depends on Finding Market for Their Output

Coal production in January, 1915, was the highest for any month of the first half of the year. February, a short month, recorded a marked decrease, and March, usually a good month, did not show much improvement. The low point for the year was reached in April, and from that time on each succeeding month recorded increases. The influence of the car shortage was plainly shown for November and December during which period the previous rate of increase was not maintained. These facts are established by returns to the United States Geological Survey.

"Shortages and surpluses of cars may occur simultaneously on different parts of the same railroad, and are to be expected at the same time on different roads throughout the country in all classes of freight equipment," said C. E. Lesher of the Survey in explaining the car shortage problem. "When the surplus is at its maximum any shortage that may be shown is small and extremely local in character. Such a condition represents a period of very slack railroad business and consequent dull times in nearly all lines of industry. A small surplus of freight equipment is indicative of heavy transportation movement and prosperous times and is usually attended by a shortage the magnitude of which depends, of course, upon the ability of the railroads to keep the surplus cars moving toward the points of shortage. Any set of circumstances that ties up a large number of cars and prevents their prompt unloading and return to service, reduces the surplus and tends to aggravate the shortage. All these conditions were met in 1915 and had a distinct effect upon the coal industry."

AS TO LABOR

In speaking of other features of the coal industry Mr. Lesher makes the following comment:

"The bituminous coal reserves of the United States are immense and the area under development and the necessary mechanical equipment available—the productive capacity, in other words—have kept pace with any demand that has yet developed. In this important respect the coal industry differs from that of the allied but competitive fuels, petroleum and natural gas. With the potential supply of the country as a whole always greater than the demand, the rate of coal production, a fluctuating quantity, depends upon conditions and circumstances outside the coal fields. Two factors, however, labor and car supply, constitute exceptions to this generalization. With regard to the possibility of inadequate labor supply, it is to be noted that in 1913, the year of maximum recorded coal production, the bituminous miners worked but an average of 232 days out of a possible 250 to 275. On the other hand, the proved reserves of petroleum and natural gas are more restricted and the available marketable supply is limited by the number of productive wells in existence at any time. Supply and demand alternate as ruling factors, and as new wells are essential to maintain or increase output, a demand in excess of supply is corrected by drilling activity inspired by rising prices. Drilling an oil well and opening a coal mine are both gambling ventures, differing, however, in that in one success depends upon finding oil or gas, and in the other, in finding a market for the output."

BUREAU OF MINES TO REPRINT SOME POPULAR PUBLICATIONS

Owing to the very insistent demand for certain publications of the Bureau of Mines reprints have been authorized of the following publications: Bulletins 67, 70 and 100 and technical papers 80 and 89, and all miners' circulars.

It is contrary to the policy of the Bureau of Mines to reprint publications for free distribution. After the original supply for free distribution is exhausted, those desiring them are referred to the Superintendent of Documents where the publication is sold at cost.

It has been judged advisable to vary from this general rule in the case of the publications mentioned, as it is to the interest of the public that they be circulated as widely as possible.

Bulletins 67 and 100 deal with certain features of the making of iron and steel. Technical paper 80 has been very popular. It is entitled "Hand Firing Soft Coal Under Power Plant Boilers." It describes the best method of firing soft coal and handling fires and discusses the loss in power generation. The bulletin tells how coal may be fired to prevent smoke. The smoke inspector for the city of Washington declares that this bulletin has done more to keep Washington clean than any of the other numerous efforts made in that direction. Decided improvements have been made in such smoky cities as Pittsburgh, Chicago and Cleveland, as a result of the general distribution of this bulletin among firemen.

Technical paper 89 is entitled "Coal Tar Products and the Possibility of Increasing Their Manufacture in the United States." This paper discusses a question of such vital interest at the present time as to make it one of the most sought after of all the publications of the Bureau.

NEEDS OF TIMES DEMAND GENERAL SUPPORT FOR NATIONAL ASSOCIATION

Local Organizations of Mine Operators Have Big Task in Meeting Needs in Own Sections But Extra Effort Must Be Made, Many Believe, in Order To Make Possible Additional Work in Washington

Here is a problem which is to be discussed at the coming convention of the American Mining Congress:

Associations of miners, not national in scope, think they have sufficient to do if they care properly for the local and state matters which require their attention. Many urge, however, that there is national work which should be done by these associations and which they could not effectively do by themselves, and if left undone, would be a severe handicap upon their operations.

The trend of the public today is for the centralization of power in the Federal Government. Mining men, as a rule, greatly regret the power of this movement, and believe that the day will come when public thought will reverse itself upon many of these questions, but the fact remains that the Federal Government is assuming increasing authority.

Ten years ago the Colorado labor trouble of last year would have been purely a Colorado matter. Last year it was the subject of four Federal investigations; one by the Commission on Industrial Relations; one by a Congressional Committee, and two by two separate Commissions appointed by the President of the United States for that purpose.

The local associations cannot, if they would, ignore these conditions in times of trouble, and many think it wise that they should put themselves in cooperation with others having a vital interest, to the end that Federal legislative handicaps shall not be fastened upon them when entering a race for justice in competition with others whose loads have been lightened and whose interests have been protected by class legislation.

No State can secure for itself such a uniformity in mining laws, and must, to accomplish this, act in cooperation with other States to the end that the best judgment of all shall agree upon the general principles which should be applied, subject to such variations as are necessary to meet local conditions.

An unjust workmen's compensation law in any other State, which may become a precedent for a similar injustice in another State, is a matter in which a lack of interest will bring its penalties.

An unjust Blue-Sky law which effectively prohibits the raising of money for the development of western mining enterprises is a handicap to some States, while upon the other hand the activities of consciousless promoters who bring disgrace upon mining by methods which all condemn, cannot be prevented locally, but should be reached in a conservative way by a great cooperative movement including all branches of the mining industry.

NATIVE SILVER FOUND IN ROCHESTER MINE

Information from Rochester, Nev., is that important developments are taking place.

The mills are all in full operation and a high percentage of extraction is being obtained from the ores. The Rochester Mines mill is being enlarged to nearly double its present capacity. The bottom of the Codd winze at the 800-foot point is all in ore which is better than milling grade and contains very rich specimens of native silver which seem to indicate concentration by descending surface waters.

In the Cerbat range of the Mohave County, Arizona, several of the larger mines are actively producing chiefly zinc-lead ores.

In the Chloride District the Tennessee mine has just opened up on the 1,400-ft. level a large body of ore averaging 50 per cent in lead and zinc. In the Midnight mine, recently purchased by Salt Lake parties for $250,000, the average zinc content of the lode, which is 40 feet in width on the 200-ft. level, is 15 per cent.

In the Cerbat District the Golconda mine has just encountered commercial ore on the 1,100-ft. level and is erecting a 200-ton oil flotation plant for treatment of zinc ores.

In the Tom Reed-Gold Road District, which for more than a year is the center of attraction in the southwest, there is a steady increase in the volume of mining. With a capitalization of more than $53,000,000 operations are being actively prosecuted by 125 separately organized mining corporations and the activity seems to be warranted by substantial results of nearly all deep development. More than 2,200 miners are actually employed in the district. More than $25,000 a day is being expended for wages and equipment. The boundaries of the district are being gradually extended by new discoveries.

Personals

M. R. Campbell and David White have added a 375-page volume to the contributions to Economic Geology of the United States Geological Survey. The work covers petroleum, natural gas and coal. It contains numerous illustrations and charts.

Judge C. B. Foote, of Kansas City, and J. H. Hoffman, of Los Angeles, who are interested in mining in Mohave County, Ariz., were in Washington recently.

Prof. B. L. Miller of Lehigh University at Bethlehem, Pa. was in Washington recently. A series of articles by Prof. Miller and Prof. J. T. Singerwald of Johns Hopkins University, Baltimore, is now appearing in the technical press.

Chas. E. Dutton, of Goldfield, Nev., paid a visit to New York and Boston on business recently.

F. J. Bailey, chief clerk of the Bureau of Mines, will attend the fifth business men's military camp at Plattsburg. W. W. Adams of the Bureau of Mines was a member of the fourth camp.

Homer P. Darlington of the Pennsylvania Salt Manufacturing Co., whose headquarters are at Natrona, Pa., passed through Washington recently on his way back from pyrites investigations in several southern States.

H. M. Griggs, general coal and ore agent of the New York Central lines, and Attorney Bronson, of the same company, were in Washington recently. They are interested in the West Virginia-Ohio rate case which is before the Interstate Commerce Commission.

A zincograph section showing the bituminous coal beds in West Virginia just has been completed by the Geological Survey of that state.

"Geology of the Foraker Quadrangle of Osage County, Oklahoma," is the subject of a bulletin just issued by the Geological Survey. It was written by K. C. Heald.

W. A. Williams, petroleum technologist of the Bureau of Mines, is on the Pacific coast supervising the work being done under the direction of the Bureau of Mines.

Dr. I. C. White of Morgantown, W. Va., has been appointed consulting geologist of the Baltimore & Ohio Railroad.

Sidney Paige, recently put in charge of the Western Areal Geology for the Geological Survey, is visiting field parties in the West.

WAR BOOSTS PRICE OF CHILE SALTPETER

The chemical difference between sodium and potassium nitrate is in the character of the basic metal. As indicated in the names of these compounds, the metal in the one is sodium and in the other, potassium. Sodium nitrate, or Chile saltpeter, is imported into this country in large quantity from Chile. The potassium or potash nitrate has come chiefly from Germany, which controls the world's potash supply. It is practically impossible to obtain potash salts of any kind at the present time and quotations on potassium nitrate (niter) have not been published for a long time. Owing to the great demand for Chile saltpeter the price of this commodity has greatly increased and it is now bringing approximately $3.00 per 100 pounds.

IN MARKET FOR MORE GIBBS RESCUE APPARATUSES

The Bureau of Mines has asked for bids on twenty-five Gibbs Rescue Apparatuses. Plans and specifications also have gone to manufacturers with the idea of ascertaining the cost of manufacturing the Burrell gas detector.

Map Plattsburg Area

George Otis Smith, director of the Geological Survey, visited Plattsburg, N.Y., in July to familiarize himself with the progress being made on the military map of that vicinity which is being made under his direction for the use of the War Department.

Justify Rate Increase on Coal

In Investigation and Suspension Docket No. 755 the proposed increased rates on bituminous coal in carloads from mines in Illinois and Indiana to points in Illinois, Indiana, Wisconsin, and Michigan found justified, and orders of suspension vacated.

F. G. Clapp and M. L. Fuller, managing engineers of The Associated Geological Engineers, have been investigating properties in Kansas. The latter has returned East, while the former has gone to Duncan, Okla.

DENVER QUARTZ MILLS

AND DENVER STEEL CRUSHERS

have that kind of reliability that constantly and continuously keeps on being reliable.

The Denver Quartz Mill & Crusher Co.
216-17 Colorado Bldg., Denver, Colo., U.S.A.

A NOTABLE ISSUE

of the Mining Congress Journal is in the making. In connection with the Annual Convention, November 13-16, the November Number will contain a large amount of additional news matter of important interest to the mining industry.

This issue of the Journal will be sent to every important mine in the United States.

Advertising space can be secured by applying to the Washington or Chicago offices of The American Mining Congress. Washington, Munsey Building; Chicago, Hotel La Salle.

THE
MINING CONGRESS
JOURNAL

OCT 16 1916
UNIVERSITY OF TORONTO

SAFETY—EFFICIENCY—CONSERVATION

VOL. II

OCTOBER, 1916

No. 10

SENATOR JAMES D. PHELAN
Whose paper on California petroleum will be a feature of the Mining Congress Convention, November 13-16

PUBLISHED BY
THE AMERICAN MINING CONGRESS
PUBLICATION OFFICE
MUNSEY BUILDING WASHINGTON, D. C.
$ 2⁰⁰ PER YEAR 20 ¢ PER COPY

The best rubber belt we have ever used

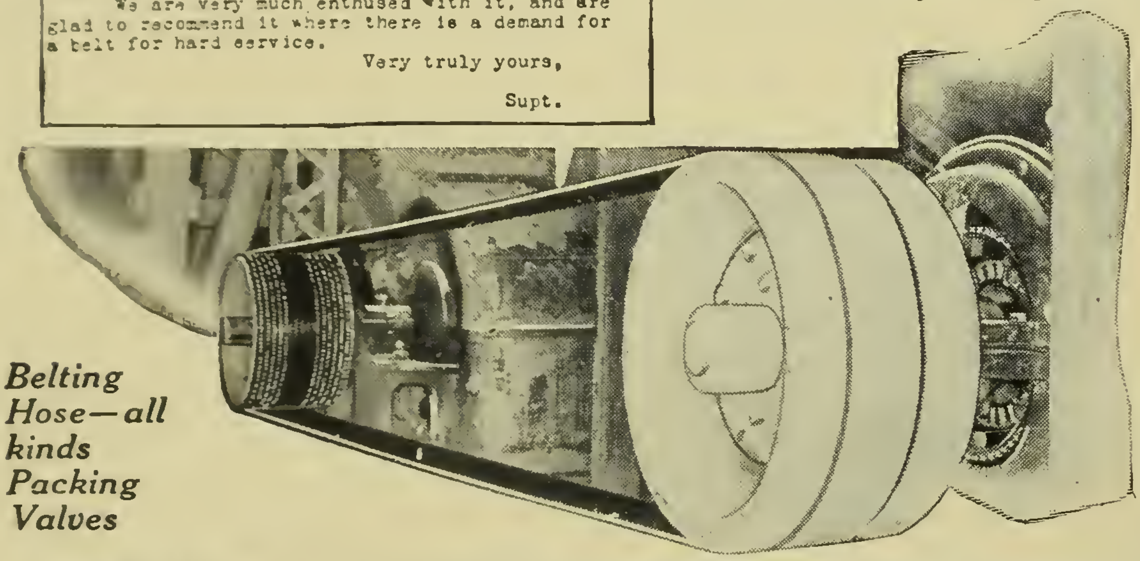
These are the words of an Ohio Superintendent using

COMMANDER
DRIVE BELT

> It is the best Rubber Belt that we have ever used. We have tried out a great many different kinds and none of them come close to equaling the service received from "Commander".
>
> Practically all of our difficult drives have been equipped with it, and on most of them we have tried many kinds of belting, without any comparable degree of service.
>
> We are very much enthused with it, and are glad to recommend it where there is a demand for a belt for hard service.
>
> Very truly yours,
>
> Supt.

Best for hard service

It takes a "Commander" belt (Commander in deed more than in name) to overcome obstinate drive conditions with a degree of satisfaction termed best by the operator.



There is only one "Commander" a marked leader that commends the admiration of the user.

That accomplishes its hardest task with lower operating costs.
That overcomes objectionable shut-downs.
That creates a new standard of volume in production

and *that* "Commander" is positively the best belt that Goodrich with its 47 years of experience can make.

Specify Commander and test its true worth.

Belting
Hose—all kinds
Packing
Valves

THE B. F. GOODRICH COMPANY Factories: AKRON, OHIO

Makers of the Celebrated Goodrich Automobile Tires—*"Best in the Long Run"* Branches and Distributors in All Districts

---

SUSQUEHANNA COAL CO.

MINERS AND SHIPPERS

SUPERIOR ANTHRACITE

GENERAL OFFICE:
907 COMMERCIAL TRUST BUILDING
PHILADELPHIA, PA.

Sales Offices:

NEW YORK - No. 120 Broadway
PHILADELPHIA - 1436 Commercial Trust Bldg.
CHICAGO - 1305 Old Colony Bldg.
ERIE, PA. - 210 Marine Bank Bldg.
BALTIMORE - 100 Chamber of Commerce Bldg.
WILLIAMSPORT, PA. - 1, 2 & 3 Hart Building

VOL. 2, NO. 10 WASHINGTON OCTOBER, 1916

THE MINING CONGRESS JOURNAL

Official Organ of the American Mining Congress

REPORTED DISCOVERY OF POTASH IN CUBA IS DOUBTED IN WASHINGTON

Formation in Antilles Does Not Favor Its Occurrence—Need for Thorough Prospecting of Favorable Areas in United States Emphasized—Drilling to Begin Again at Cliffside in the Near Future

While it cannot be said at this time that the reported discovery of potash in Cuba is entirely without foundation the Government's specialists interested in the matter are inclined to the opinion that no important deposit of potash exists in Cuba. The formation is not favorable for its occurrence and careful inquiry in Havana has failed to bring out any substantiation of the report.

It seems to be the consensus of opinion here that the deposits in Cuba probably are potash silicates in the volcanic breccia. They probably are soluble only in acid or after roasting. It is thought the percentage of potash is nowhere near as large as stated.

This alleged discovery has been given wide publicity and has turned public attention again to the work being done by the Geological Survey and the Bureau of Mines in an effort to locate potash deposits in this country. The drilling at Cliffside, which had to be suspended on account of insufficient funds, will be begun again in a few days it is expected.

HISTORY OF WORK

As to drilling by the U. S. Geological Survey for potash near Cliffside, Texas, Director Smith, of the Survey, says:

"Late in the summer of 1915, after several holes had been bored in the Smoke Creek Desert of Nevada, it was concluded that tests should next be made in the Red Beds region of the Southwest where, for two seasons, geologic investigations had been made of the stratigraphy and evidence as to conditions of deposition of the Red Beds, particularly as to the centers of greatest precipitation of gypsum, salt, and other deposits as the result of evaporation of shallow basins of the inland sea. It is believed that, at present, the most promising locations for boring in the search for such potash deposits lie somewhere in the Red Beds basins of west Texas, eastern New Mexico, and western Oklahoma. Of course, it can not be definitely predicted, in advance of actual boring, whether in these basins the evaporation was so complete as to force the precipitation of the potash salts as well as the gypsum and rock salt or whether, if the potash was precipitated, it will not be found so diffused and held in clay sediments as to render its extraction impracticable

"Particularly on account of the traces of potash found by Prof. J. A. Udden, of the State Bureau of Economic Geology and Technology, near Borden, Texas, and at two other localities in the northern part of the State, Cliffside was chosen for the test and the Survey outfit was shipped thither from Nevada. All available funds, which could legally be allotted to the work, were so directed but, on account of unexpected difficulties in securing water supply for the use of the drill and camp and of accidents, such as are incidental to boring in the Red Beds, it was found impossible to carry the hole beyond a depth of about 370 feet before the near exhaustion of the funds compelled suspension of the work very early in the spring.

MONEY INSUFFICIENT

"Now that the new appropriation is available the matter has already been taken up again but, on account of the small amount of funds available for drilling, I am in despair as to being able to drill to the depth required for complete test at this point. The total amount added by Congress to the appropriation for chemical and physical researches for this special search for potash is but $20,000. With this money the Geological Survey is obliged to carry the cost of field investigations of reported discoveries of potash in different parts of the country, to carry on correspondence and to test samples sent in by prospectors, farmers, engineers, and citizens in different States, as well as by its own geologists, for tests in the Survey laboratories. In cases where the samples show appreciable amounts of potash, detailed information as to location and conditions of occurrence is solicited by correspondence in order that, if these data and the results of the tests are sufficiently encouraging, geologists may visit the deposits, investigate the source of the salts and pass upon the prospects as to quantity, official samples being, of course, taken for chemical analysis, which may be made public by the Survey. Samples from wells drilled in salt-bearing formations for purposes of irrigation or in exploration for oil or salt deposits have been collected and subjected to analysis in the Survey laboratories.

"Further, the inquiries presented by chemical engineers as to the distribution and potash contents of certain types of siliceous rocks in different parts of the country have been given some attention. In this connection, careful sampling has been made, for chemical analyses, of the green sand deposits in New Jersey, Delaware, Maryland, Tennessee, and North Carolina, in order that reliable information, as to the extent and accessibility of the deposits and, in particular, as to the potash contents, may be made available, the earlier analyses current in the reports being, in many cases, very erroneous as to the percentage of potash present in the samples. Also, the sericite deposits of the Georgia-Carolina region have been sampled in the field in order that information might be gathered as to the extent of the deposits as well as to the amount of potash carried by the sericite in different localities.

CLAY TAKES UP POTASH.

"In general, the exploration by the drill in the deposits of the old evaporated lakes in the Great Basin region, on account of the dissemination of the potash in the clays, has proved disappointing though the explorations have contributed materially to the development of potash brines, which are now yielding potash on a small scale at Searles Lake and at several points in Nebraska, as well as of the alunite deposits near Marysvale in Utah.

"At Cliffside, the Survey has a rotary rig of special design, which is capable of drilling to a depth of 2,000 feet. A large amount of casing and some new tools are necessary to carry the hole to a depth of 2,000 feet or more if the drilling is done by the Survey with its own equipment, as has, in Nevada and California, been found much less expensive than drilling by contract. The cost of the casing must be deducted from the funds available for drilling. Accordingly, the prospect of being able to drill the hole to the entire depth—about 2,300 feet—to which it should be drilled to make a complete test, during the current fiscal year, is not very good.

"During the work about to be begun again a chemist will be detailed to test the cuttings from each screw and the water used in drilling or brought up by the bailer at any time. Such scientific observation on the ground is essential to the determination both of the thickness of the beds, which may be found to contain potash in important amounts, and the richness of the salts or sediments at any given level.

"In portions of the Red Beds region, occasional drilling is done in the exploration for oil and, in these cases, it is the Survey policy to get in touch with the driller and bespeak his good offices and cooperation through forwarding samples of the rock cut in the vicinity of salt and gypsum beds and samples of the brines, for testing. Obviously, if the Survey is not given money sufficient to drill a single satisfactory test, it must utilize every opportunity to secure information that may be gained from holes drilled in other regions where saline deposits may be encountered, though the locations of these may not, from the standpoint of the history of the deposition of the Red Beds series, be especially favorable.

THE PROSPECTS

"As to the likelihood of the occurrence of beds of potash salts deeply buried in the basins of the Red Beds region, nothing definite can be stated, but the facts, (a) that the deposition of the Red Beds series was attended by excessive aridity at different times; (b) that great thicknesses of gypsum, rock salt, and anhydrite are known to be present in certain areas of the Red Beds country, as revealed by logs of oil or water wells or in outcrops; (c) that the depositional conditions appear to have included shallow evaporation basins of restricted extent, presumably distributed throughout portions of the area; (d) that the shales, sandstones, thin limestones, etc., of the Red Beds series are similar in general character, were laid down contemporaneously, and similarly certain interbedded salts and other precipitates, comparable to the principal potash-bearing basins in Germany; all point toward the conclusion that the chances for finding beds of potash buried somewhere in the Red Beds basins are probably better than in any other region of the country. The further fact that traces of potash are reported by Professor Udden to have been found at several points in north Texas is encouraging, though, after all, it may be either that the potash is not present in commercial quantities anywhere in the region or that the potash salts, which will probably be lenticular in their occurrence, are so restricted in their distribution that a considerable number of wells may be drilled at carefully chosen localities without encountering one of the lenses. Let me add in this connection that the first traces of potash deposits found in north Texas, namely, the samples from the Spurr well in Dickens County, were discovered by Professor Udden while gathering well logs and samples in the Red Beds region under the auspices of this Survey.

"I have explained, at considerable length, the drill situation confronting the Survey. The country needs potash desperately and the Geological Survey will do the best that it is able, with the small amount of money available, to find potash deposits. It will, I trust, be possible to bore at least to a depth of 2,000 feet, which will exceed the depth at which the more important traces of potash are believed to have been found

A MATTER OF BORING

"In conclusion, I would like to emphasize that the exploration conducted by the Geological Survey is now generally conceded to have developed chiefly into a matter of boring and that the rate of progress in this type of work, taken with the necessity for many chemical analyses and keeping watch of minor developments in the country, becomes almost impracticable with the small appropriation that has heretofore been made for the Survey potash work. It would cost no more in the end to expedite these practical tests with the drill by providing sufficient funds for energetic prosecution of the exploration work and, as a matter of fact, the scientific supervision of the investigation on the larger scale would cost no more than at the present halting rate of progress. With the present appropriation of $20,000, the Survey can not conduct its potash work on a business-like basis."

Cost of Coal to be Discussed.

A paper on "The Cost of Coal" by George Otis Smith and C. E. Lesher of the United States Geological Survey is certain to excite considerable interest when it is read by Dr Smith at the convention of the American Mining Congress in Chicago next month It is understood that it is the purpose of the authors to present the general facts and analyse the actual cost of coal both anthracite and bituminous. Dr. Smith is said not to be afraid of public operation if it should mean cheaper coal, but he thinks the facts need to be analysed very carefully before many can be convinced that the private operation of coal mines are so wasteful or inefficient as to justify government operation.

Maps Oatman District.

Owing to the increasing importance of the Oatman-Gold Roads mining district the United States Geological Survey has undertaken the topographic mapping of that region In the near future a geological survey of the district is contemplated

IRON PYRITE PRODUCTION BREAKS ALL RECORDS

The domestic production of pyrite in 1915 attained a new high level, due chiefly to the unprecedented demand for the ore in making sulphuric acid, says a Geological Survey report. The production was 394,124 long tons, valued at $1,674,933, an increase of 52,462 tons in quantity and of $391,587 in value, compared with 1914. The consumption of ore—that is, the combined domestic production (394,124 tons) and imports (964,634 tons)—was 1,358,758, a decrease of 4,521 tons, compared with 1914 This was caused by the falling off in imports. The general resumption of activity at acid plants especially created a great demand for both foreign and domestic pyrite, and the imports, particularly of European pyrite, would have been larger if suitable vessels had been available for the carrying trade.

Virginia, as usual, ranked first among the States in both output and value of pyrite in 1915, there being marketed 145,050 long tons of pyrite, valued at $729,644, an increase of 3,774 tons in quantity and of $173,553 in value. The great increase in value was due to the demand for the pyrite for use in making acid, a demand which greatly increased toward the end of the year and continued in 1916.

The pyrite came from the Arminius mine, of the Arminius Chemical Co., the mine of the Sulphur Mining & Railroad Co., and the Boyd-Smith mine, all near Mineral, Louisa County; from the Gossan mine, of the General Chemical Co., at Monarat, Carroll County, and from the Bertha Mineral Co., Austinville, Wythe County The Cabin Branch Mining Co., which heretofore has been an important producer of pyrite at Dumfries, Prince William County, reported no output in 1915

COAL SHIPMENTS GAIN 10 PER CENT OVER LAST YEAR

August, 1916, showed an increase in shipments of bituminous coal of 10 per cent over August, 1915 and of 13 per cent over July, 1916 The corresponding increases in beehive coke shipments were 9.5 per cent and 9 per cent, according to the U S. Geological Survey

DR. PARSONS TO VISIT EUROPEAN NITRATE PLANTS

Dr Charles L. Parsons, head of the division of mineral technology of the Bureau of Mines, will sail from New York, October 6, en route to several European countries, where he will make an investigation of nitrate plants His report is expected to have an important bearing on the method of nitrate manufacture which will be adopted by the United States Government

GOVERNMENT EXPERTS WELL KNOWN TO MINING MEN

Photo by Harris & Ewing.

EUGENE W. SHAW
Geologist

Eugene Wesley Shaw, who was born in Delaware, Ohio, July 29, 1881, was a farmer's son, one of three brothers, each of whom became scientists, the other two being a botanist and a chemist. Following his graduation from the Delaware High School he attended the Ohio Wesleyan University from which institution he was graduated with the degree of Bachelor of Science and a Magna cum Laude in geology. Thence he went as a fellow to the University of Chicago, where he did some post graduate work in geology. During his term as a student in these universities he took advantage of opportunities offered to do tutoring in various lines, including geology, bird study and botany. However, ever since he ran away from home to hunt fool's gold, Mr. Shaw seems to have had no doubt but that his life work was to be geology.

In 1907 Mr. Shaw cast his lot with the U. S. Geological Survey. His first assignment was on coal and gravel deposits in central Wyoming. His next work was on areal geology in western Pennsylvania, and in connection with this work a new hypothesis for the origin of the remarkable high terraces of the region was formulated.

In following years Mr. Shaw surveyed all or parts of 20 quadrangles in Illinois and prepared folios on them. In connection with work in this State, and in Missouri, and Kentucky, he discovered a chain of recently extinct lakes almost as extensive as the Great Lakes. He also examined the lead and zinc areas in northwestern Illinois and the Carlyle and Sandoval oil fields. In 1912 he began a study of the Mississippi delta, particularly of the curious upheavals at the mouths of the river, known as Mud Lumps. For purposes of comparison he visited the deltas of certain rivers in Europe, Asia and Africa. To ascertain the nature of the submarine portions of the Mississippi delta and the character of other off-shore deposits, the services of the U. S. Bureau of Fisheries steamer Fish Hawk were obtained and Mr. Shaw conducted an expedition for the collection of sea-bottom sediments along the Gulf coast from Galveston to Key West and along the Atlantic coast from Key West to Charleston.

Mr. Shaw's recent undertakings have been a study of the Florida keys, a part of this work having been done with diving apparatus, an investigation of the gas resources of northern Texas, and an examination of the petroleum fields of Mexico. He is now preparing a report on the surface geology of Mississippi and will next undertake a general survey of oil and gas fields of the southern Appalachians.

SOUTH AMERICAN PLATINUM INFLUENCING WORLD MARKET

While specialists at the Geological Survey are not able to explain from first-hand knowledge the exact causes of the decided fall in the price of platinum, they are in possession of some facts which doubtless have a bearing on this slump in prices. The production of platinum in South America has greatly exceeded the estimates of two years ago. This doubtless has had an important bearing on platinum prices. It also is regarded that it contributes to the tendency of prices to fluctuate violently, as the South American production is erratic.

Another cause of the decreased prices doubtless is the development of numerous substitutes for platinum and the fact that they are proving successful. This is especially true as applied to the dental trade. The use of platinum in the arts in many cases has tended to be a fad and its scarcity and increased price have resulted in greatly decreasing the quantities being thus used.

So far as can be learned here very little of the Russian supply of platinum is reaching the United States. What Russian platinum is being exported is going to the Allies and considerable care is being exercised that none of it reaches neutral countries.

GOVERNMENT OFFICIALS AND SPECIALISTS WILL ATTEND MINING CONVENTION

Prominent Men Interested in the Mining Industry Will Gather at Chicago November 13 in Answer to the Call of the American Mining Congress — Big Questions Confronting Industry to be Discussed

Prominent representatives of the Government will attend the nineteenth annual convention of the American Mining Congress which opens at Hotel La Salle, Chicago, November 13. There is also the hope that both the Secretary of the Interior, Mr. Lane, and Secretary of Labor Wilson will be present and take part in the important discussions. Van H. Manning, Director of the U. S. Bureau of Mines, will deliver an address on "The Past and the Future of Mine Safety Work." This will emphasize the tremendous advance already made through the efforts of the Congress and the Bureau, in the way of safety methods, and outline the greater needs of the future.

Geo. Otis Smith, Director of the U. S. Geological Survey will be present and read an important paper.

W. S. Gifford, executive director of the U. S. Commission on Industrial Preparedness, will deliver what promises to be a notable address at the coming convention, on "Efficiency in the Handling of Productive Forces."

Chairman E. T. Hurley, of the Federal Trade Commission, will speak on "The Work of the Commission and the Mining Industry."

In all of the "Sectional" meetings the experts will be present to advise. Dr. F. G. Cottrell's address on "The New Things in Science" will be one of the most comprehensive resumés ever given on the accomplishments of the past few years. C. E. Siebenthal, of the U. S. Geological Survey, is also one of the well-known Government experts who has promised to attend.

Dorsey A. Lyon, oil flotation expert will talk on that topic.

REVISION OF LAWS

The convention will endeavor to formulate definitely the long-sought-for and long-fought-for revision of the mining laws of the country.

Dr. Foster, of Illinois, chairman of the House Committee on Mines and Mining, will be in attendance and will report on the actual progress made on this subject by Congress, giving the objections raised to many of the contemplate changes, and his ideas as to what can be passed through both houses of Congress.

The battle promises to be a long and hard one, but the American Mining Congress has a record of successes that mark it a great power for remedial good in the mining field east and west.

GOV. DUNNE, OF ILLINOIS

Who has done much to insure the success of the Mining Congress Convention

The first appeal made by the American Mining Congress for a Bureau of Mines was backed by less than one-twelfth of the members of the House of Representatives. But on May 16, 1910, the bill was signed by the President, and on February 25, 1913, an amended bill was signed covering more particularly the Western situation.

Since that time the efforts of the American Mining Congress have been directed, in part to securing adequate appropriations for the work of the Bureau. This struggle has been no easy one but on the whole has been extremely satisfactory as Congress is now pledged to furnish the Bureau $1,500,000 annually for the next three years.

The greatest work of the American Mining Congress is, however, along the lines of planning legislation which provides greater safety for the lives of the men engaged in coal and metal mining operations. The results of legislation initiated by the American Mining Congress has reduced by nearly one-half of the number of men killed per million tons of coal produced. Acting on the humanitarian impulse created by this movement of the American Mining Congress, the big organizations of the country have almost without an exception introduced the splendid "Safety First" efforts which have been so productive of good results everywhere.

The American Mining Congress has secured the adoption of laws by many States East and West making misrepresentation of mining stocks a misdemeanor.

It has prepared comprehenisve laws for the use of electricity in mines. That which applies to coal mining operations has been adopted as a whole by the State of Pennsylvania and has been considered by other States. Its model law for the creation of mine drainage districts, its work for substantial aids to State Mining Schools, its protests against Federal interference with water power, its comprehensive investigation of mine taxation, are but a few of the things which the American Mining Congress has accomplished.

TO DISCUSS OIL PROBLEMS

The general meetings are to be held in the mornings, and the sections devoted to oil, coal, lead and zinc, copper, and precious metals, are to meet every afternoon in their own assembly rooms at the hotel. One of the special questions in the oil section will be that relating to the rights of the Western oil claimants upon lands withdrawn from entry and upon which large development has been made.

But there will also unquestionably be an emphatic protest against the policies of the Government in the proposed creation of naval oil reserves, and more particularly against the policies which work gross injustice to oil claimants who located their claims and carried on development work under the provisions then existing legislative conditions.

The convention promises to be epoch-making in more respects than attendance.

The programs for the general meetings and those for the "sectional" gatherings under "Zinc and Lead," "Precious Metals," "Coal and Oil" have now been supplemented by three meetings of copper men.

An assembly hall in hotel La Salle has been set apart for this section, and its first meeting will take place Tuesday, November 14, at 2 p. m.

This will be presided over by Hon. Wm. A. Clark. The principal addresses for the first session will be on "The Copper Resources of the United States," by Walter Harvey Reed, of New York; "The Future of Copper" by Thomas F. Cole, of Duluth, Minn., and one on the "Relation of American Copper Supply to Industrial Development" by a speaker of prominence in this industry.

On Wednesday afternoon in this section the address on "Copper in its Relation to Preparedness" will be by Mr. C. F. Kelley, Mr. R. C. Gemmell, of Salt Lake City, is to have an address on the question "Should the Export of Copper at Production Cost Prices be Discouraged?"

Another address of the day will be on "Copper in its Relation to Industrial Efficiency."

On Thursday in this section Dr. L. D. Ricketts will preside. The principal address of the day will be on the question "Should Combinations be Fostered to Command for Export of Copper a Price Commensurate with its Actual Value in Commercial Development?" Every effort is being made to have John D. Ryan, of New York, talk on this topic. Another address of the day by an expert is on the subject "Relation of the Federal Government to Copper Export."

George Otis Smith and C. E. Lesher, the Director and Statistician of the Geological Survey respectively, will prepare a paper for the convention on "The Cost of Coal." Mr. Smith will present the paper.

Dr. Henry Mace Payne, a mining engineer with a large experience in Alaskan and Siberian mining, is to give a lecture illustrated with pictures of the frozen gravels of the North. Dr. Payne was employed by the Russian Government to inaugurate the plan of coal mining developed by him in Alaska.

E. L. Doheny, an oil operator of Los Angeles, is to give an illustrated lecture on the famous Cerro-Azul gusher in Mexico.

Otto Ruhl, a statistician of the Joplin lead and zinc district, will read a paper on "A Tariff for Revenue as Related to a Compensating Duty on Lead and Zinc Ores."

W. A. Williams, of the U. S. Bureau of Mines, will give a lecture on "Oil Resources of the United States."

Judge J. G. Gamble, of Des Moines, will read a paper on taxation of coal mines.

S. A. Taylor, of Pittsburgh, a mining engineer and coal operator, former president of the American Mining Congress, will give his report on "Uniform Cost Accounting." The discussion which will follow the presentation of this important question bids fair to be very interesting.

H. G. James, of the Independent Oil Producers' Association, will talk upon the necessity of a Federal Oil Bureau.

Dr. W. P. Whitney, scientific investigator for the General Electric Comuany, will prepare a paper dealing with the attitude of the American toward scientific research.

J. C. McDowell, of Pittsburgh, will read a paper on the relation of geology to the oil industry.

Hennen Jennings, a nationally known mining engineer now living in Washington, is preparing a paper on "The Accomplishment of Invention and Its Relation to the Mining Industry."

STATE GEOLOGISTS JOIN IN FIELD EXCURSION THROUGH NEW YORK STATE

Director Smith and Chief Geologist White of United States Geological Survey make Trip with Representatives of Many State Surveys—New York's New Museum Comes in for Praise

One of the most successful annual field excursions made by the State Geologists was that which took place last month. The attendance was representative and some very interesting inspections were made.

George Otis Smith, director of the United States Geological Survey, and David White, chief geologist, went on this field excursion. Director Smith was very much impressed with the new state museum of New York. Through the kindness of State Geologist Clarke an opportunity was given to inspect the museum fully. With reference to this visit Director Smith said:

"While New York is not one of the richest mining states, it possesses large mineral wealth. The mining industry there is fortunate in having this phase of the state's resources so fully displayed by exhibits in the economic geology section of the museum. Indeed every citizen of New York is fortunate in having available so splendid an educational display in the preparation and maintenance of which the highest scientific talent has been utilized, judging from the results.

"It is hard to conceive of a better small museum. In my opinion the State museum is large enough to serve its functions as an important adjunct to the educational system of the State."

The object of the excursion was the examination and comparison of some of the typical exposures of earlier Paleozoic formations. Another purpose was to study the structure and origin of the Lake Champlain basin and to observe the occurrence of the great bodies of magnetite ore in the region. The methods of mining, concentration and preparation for the market also were observed.

Some attention was given by the geologists to the marine shell bearing Champlain clays and the terrace evidence of the former levels of the sea during Pleistocene times.

Among the participants in the excursion, which was under the able guidance of Dr Clarke and his associates, Dr. Rudolf Ruedemann and Mr Hartnagel were: Prof William North Rice, of Wesleyan University, Middletown, Conn., and a member of the State Geological Commission; Dr I C White, State Geologist, of West Virginia; Prof. Geo H Perkins State Geologist of Vermont; Prof. W. O. Hotchkiss, State Geologist, of Wisconsin; F W DeWolf, State Geologist, of Illinois; Dr C W Shannon, State Geologist, of Oklahoma; Prof H L Fairchild, of the University of Rochester; Dr. Geo. Otis Smith, Director of the U S Geological Survey; David White, Chief Geologist of the United States Geological Survey; E O. Ulrich, Geologist, U. S Geological Survey; Dr Joseph Hyde Pratt, State Geologist of North Carolina; Dr E H Sellers, State Geologist of Florida; Prof. H. F. Cleland, of Williamstown College; Dr J A Bownocker, Director of the Geological Survey of Ohio and Prof. Geo H. Hudson, of Plattsburg, N. Y.

Reports Cover Nevada Camps

Up to the year 1908 the work of the Geological Survey in Nevada had consisted of regional geologic reconnaissance, the detailed study of certain important mining districts, and the reconnaissance of a few of the less productive or less active districts, the work last named being incidental to other investigations. During that year a beginning was made in an effort to obtain some first-hand knowledge of the geologic relations of the ores in virtually all the mining districts of Nevada. One object of this work was to gather material which might subsequently be used in a general summary report on the geology and ore deposits of the State. Another was to procure and disseminate information concerning the less known and to a large extent undeveloped and comparatively inaccessible districts. In pursuance of this plan a number of reconnaissance reports have been published.

GEOLOGISTS TO DISCUSS PETROLEUM AT NEXT MEETING

In keeping with the tremendous interest aroused on the part of the public through the increasing dependence for its welfare and daily comfort on the petroleum industry, the officers of the Geological Society of America are planning to include in their program, for a meeting to be held at Albany next Christmas week, a symposium on petroleum in which the original conditions of occurrence, composition, the geographic description of deposits and latent supplies of petroleum will be discussed by a number of the foremost geological authorities of the various bodies.

GATHERS INFORMATION AS TO IRON AND STEEL IN TEXAS

Col. L. P. Featherstone, of Beaumont and Longview, Texas, called at the Geological Survey recently to gather information as to the iron and steel making resources of Texas. Col. Featherstone holds large interests in the brown iron ore section of northeastern Texas and has offered to donate to the United States Government 1,000,000 tons of iron ore provided the proposed armor plate plant is established at Beaumont. The advantages of Beaumont have been presented to Secretary Daniels in the course of hearings in the matter of selecting a site for the armor plate plant.

A year ago Col. Featherstone was more particularly interested in the establishment of the armor plate plant at Port Bolivar, but since the recent storm and tidal wave that plant has been abandoned. At a point as far inland as Beaumont the danger to such an important plant from gulf storms would not exist, he points out.

GEOLOGICAL STRUCTURE OF COAL BEDS IN KENTUCKY IS MAPPED

A report on the coals of the western Kentucky fields bordering on the Ohio River in the Shawneetown quadrangle, by Wallace Lee, has just come from the press of the Kentucky Geological Survey. The area which has been done cooperatively by the State and Federal Geological Surveys contains the high rank coals of western Kentucky. A description of the coal beds, thirteen in number, are covered by sections and analysis. Most of the latter are being made by the Bureau of Mines.

Notwithstanding the extent to which the coal area is masked by thick alluvial deposits, the author of the report has very cleverly succeeded in mapping the geological structure which is somewhat faulted. As a whole the structure is regarded by him as rather unfavorable for the occurrence of oil and gas in commercial amounts.

TO WORK FOR INCREASED CIRCULATION OF REPORTS.

In order to secure a larger circulation of the publications of the Geological Survey, R. C. Shelse has been made the head of a new division of distribution. This appointment is made with the definite purpose of carrying out even further the policy of getting Survey publications into the hands of those who need them and those who will make the most use of them. In this side of the work of a scientific bureau it is recognized that it is especially necessary for the best of business methods to be used to give the public the prompt service which it desires and deserves.

LOUISIANA AND TEXAS PRODUCE 98 PER CENT OF COUNTRY'S SULPHUR

Sulphur was produced in 1915 in Louisiana, Texas, Nevada, and Wyoming. The production in the two Western States was small, amounting to only slightly more than 1 per cent of the total output of the country. Thus more than 98 per cent came from the Union Sulphur Co., in Louisiana, and the Freeport Sulphur Co., in Texas. To avoid revealing confidential reports of output of these companies the figures for sulphur will not be tabulated, as they have heretofore been, says W. C. Phalen, in his Geological Survey report, which just has been issued. They will be published in the table of mineral production of the United States and in the totals for the two States named, lumped, however, with other commodities, so that the value as sulphur will not be shown.

Though 1915 was a prosperous year in the sulphur industry, the output was not so great as in 1914. During the early part of the year business was somewhat dull, but it improved gradually as the year advanced. Slack conditions in the paper trade account in part for the falling off. The export trade in sulphur, as will be noted from a later statement in this report, was the lowest in some years, in spite of the partial paralysis of the sulphur trade in Italy incidental to the war in Europe. European inquiries for American sulphur have come from as far away as Greece.

Though the imports of foreign pyrite were not so great in 1915 as in 1914, they amounted to 964,634 long tons. In spite of these large imports and of a domestic output of pyrite of 394,124 long tons (an increase as compared with 1914), there has been, especially late in 1915 and early in 1916, an increasing call for sulphur from which to make sulphuric acid, owing to the great expansion in certain branches of chemical industry, and to the fear that in some way foreign shipments of pyrite might be curtailed. The high price received for the acid has made the use of the comparatively high-priced sulphur possible, but the use of sulphur has also certain obvious advantages owing to its purity and to the consequent fact that it leaves little or no residue. It is possible that in the manufacture of the highest grades of acid sulphur will continue to be used.

ARGENTINE ENVOY INVESTIGATES PETROLEUM PRACTICES HERE

Domingo Nogues is investigating the oil industry of the United States for the government of Argentina. The Argentine government never has formed a definite petrolum policy and is anxious to take advantage of the experience in this country before attempting legislation in this regard.

MINERS APPRECIATIVE OF BUREAU OF MINES WORK, DIRECTOR MANNING FINDS

After Extended Trip in West Mr. Manning Finds Much to Encourage Him—Conducts Hearings in Northwest with View of Ascertaining Best Location for Mining Experiment Station.

That the mining industry is highly appreciative of the work being done in its behalf by the Bureau of Mines, is the firm belief of Van. H. Manning, director of the Bureau of Mines, who has just returned to Washington from an extensive trip through the mining sections of the country. Mr. Manning was sent primarily to the Northwest by the Secretary of the Interior to determine the respective qualifications of the various points applying for the mining experiment station to be located in that part of the country.

Previously Tucson, Ariz., and Fairbanks, Alaska, had been designated for the other two stations which were appropriated for by the last Congress. In the Northwest, however, a number of places were very anxious to secure this Government station. Such convincing arguments had been forwarded to the Secretary of the Interior by various places interested as to make necessary the personal visit from the Director of the Bureau. Mr. Manning was accompanied by F. G. Cottrell, the chief metallurgist of the Bureau; D. A. Lyon, who is to be superintendent of the Northwest station, and G. A. Hulett.

During this entire trip the director and his party were enthusiastically received by the mining men. They were entertained most generously at every point visited. So frequent and spontaneous were the assurances that the Bureau's work is being appreciated that the director has returned to Washington greatly encouraged and strongly of the belief that the obstacles, which have been in the way of the work of this Bureau, are greatly less than they were even a few years ago.

Mr. Manning made his first stop at Kansas City to visit the safety-first train. The next stop was at Golden, Colo., where the Bureau of Mines is being aided in its work by the Colorado School of Mines. The Salt Lake City station was then visited. In connection with the work of the Anaconda Smelter Commission, of which Mr. Manning is a member, a stop was made at Anaconda. While there careful note was taken of the many large operations that are being conducted by mining companies at that point and Butte.

From Butte, the director's party went to Spokane where a hearing was given those interested in having the Northwest experiment station located at that point. Hearings were held at other places in the following order: Wallace, Idaho; Moscow, Idaho; Pullman, Wash.; Seattle, Wash.; Portland, Ore.; Corvallis, Baker City and Grants Pass, Oregon.

After a careful consideration of the testimony in connection with such observations as were made by the director and his technical assistants, a conclusion was reached as to the point at which the Northwest station should be located. These conclusions were sent to the Secretary of the Interior, but as the Secretary is engaged in the Mexican conference it has been impossible for him to consider the report. It is expected that he will approve the recommendation of Mr. Manning, but several weeks may elapse before he will be able to digest the information on which Mr. Manning's decision is based.

Announcement was made recently in some papers to the effect that Seattle had been selected for the mining experiment station. This announcement was in error as no decision has been reached in the matter.

After having conducted hearings in regard to the experiment station, Director Manning and his party visited the San Francisco office of the Bureau, which is devoting most of its time to petroleum investigations. A trip was made down the San Joaquin Valley with W. A. Williams, chief of the division of petroleum technology of the Bureau of Mines and W. R. Hamilton, a petroleum engineer of San Francisco. Mr. Manning made a personal visit to a large number of California oil fields including the naval reserve. From California Mr. Manning went to Tucson, the site of one of the new experiment stations, and from there returned directly to Washington. With regard to some features of the trip Mr. Manning made the following statement:

"On July 22 Secretary of the Interior Lane announced the location of two of the three mining experiment stations and the three mine safety stations appropriated for at the last session of Congress. The first of these experimental stations is to be at Fairbanks, Alaska, the second at Tucson, Ariz., and the third at a point not announced, in the Pacific Northwest. The exact location of the last-named station was held in abeyance pending a personal investigation by myself into the claims of the applicants for this station.

"The safety stations or rescue cars were located by the Secretary at Butte, Mont.; Reno, Nev.; and Raton, N. Mex. The contract for these cars has been let and they will be delivered February 1, 1917. The personnel of these cars will be as follows: One mining engineer, one surgeon, one foreman miner, one first aid miner, one clerk and one cook.

"The sum of $101.500 was appropriated for the three rescue cars, their operation and maintenance, and employment of the personnel.

"The act relating to the establishment of the experiment stations as approved March 3, 1915, provides for the establishment in the several important mining regions of the United States of ten mining experiment stations and seven mine safety stations, in addition to those already established. The act, however, provides that not more than three of the experiment stations and three of the rescue cars shall be provided for or established in one year. In other words, three stations and three cars are provided for during the current fiscal year and three each during the following years until the stations and cars are established.

"The law authorizing these stations provides for investigations with a view to improving conditions in mining, quarrying, metallurgical and other mineral industries, safeguarding employes and improving the mining conditions; thereby preventing unnecessary waste of life and resources. The locations of these stations comes at a time when the mining industry particularly needs them, and will be a great impetus to the industry in the development of processes, many of which are now under way. The mining industry in the West is enjoying unprecedented prosperity, employing more men and utilizing the low grade ores and deposits to the highest extent. I found that the abandoned dumps which were supposed to contain material not worth while to treat, are being worked over for their valuable ore content. Old mines are being reclaimed and many prospects heretofore abandoned as not being workable are being turned into substantial mines.

"I found a great deal of friendly and earnest rivalry between the different localities for these experiment and safety stations, and it has been a difficult problem for the Secretary to reach his conclusions as to the best locality for the stations. The location of these stations and cars has been given most careful consideration, and I hope that the locations will meet with the approval of the entire mining industry."

GOLD, SILVER, LEAD, ZINC AND COPPER CLOSELY RELATED

H. D McCaskey, chief of the division of mineral resources of the U. S. Geological Survey, is the author of the following comment on the relationships of certain metals:

In the mining industry five metals are closely related in both the genesis and the geologic occurrence of their ores. They also hold together in mining and in metallurgical treatment. They are gold, silver, copper, lead, and zinc. Of their ores some contain all five metals, many contain three or four, and few contain only one. Gold and silver, for instance, on the one hand, and lead and zinc, on the other, almost always stand in close genetic relations, and the ores of each two are usually mined together. Copper ores almost invariably produce some silver and gold as well as copper, and lead ores, with certain exceptions, produce notable supplies of silver. Zinc ores in the Western States contribute also to the silver production. In the same mines sometimes, and in the same mining district frequently, all five metals occur in commercial quantity.

This situation is recognized by the United States Geological Survey in its publication of the annual reports on the mineral resources of the country. Hence the general treatment of each of the five metals in the general reports and the grouping together of the related metals in the various mines reports descriptive of individual or geographically grouped States.

In measurements of ores, concentrates, and similar material the short ton of 2,000 pounds is used. The ore classification is necessarily arbitrary in part. An ore is generally understood to be worked at a profit for one or more metals. The complex nature of western ores, especially, and the graduations from one well-recognized class to another render essential some fixed measures for the terminology used. The dry or siliceous ores comprise gold and silver ores proper, as well as fluxing ores carrying considerable quantities of iron and manganese oxides and very small quantities of gold and silver, and also precious metal bearing ores carrying copper, lead, or zinc in quantities too low to classify them as copper, lead, zinc, or mixed ores. The copper ores include those carrying over 2½ per cent of copper, or even less in the cases of the great disseminated copper deposits of the West and of the copper ores of the Lake Superior region. In general, the lead ores are those containing over 4½ per cent of lead, and the zinc ores are those containing 25 per cent or more of zinc, both irrespective of their precious metal content; but some ores of lower grade in lead, and especially in zinc, are treated profitably for these metals, and of course they are then classified as lead or zinc ores, as the case may be. The mixed ores are combinations of the ones enumerated.

To Work in Nevada and Arizona.

In order to bring up-to-date certain work in the Wonder, Fairview, Rawhide and neighboring districts, F. C. Schrader of the Geological Survey, is in Nevada. He also will do work in Gila River County, Arizona. He will be away from Washington two months.

MOBILIZATION OF NATION'S INDUSTRIES PLAN OF NATIONAL RESEARCH COUNCIL

Director Manning of Bureau of Mines Attends Important Meeting at Which Work is Organized—Would Render U. S. Independent of Foreign Sources of Supply in Case of War

At its annual meeting in April the National Academy of Sciences volunteered to organize the scientific resources of educational and research institutions in the interest of national preparedness. This offer, which was immediately accepted by President Wilson, has led to the establishment of the National Research Council.

Public welfare and national security depend upon industrial progress and military efficiency; and these, in turn, result from practical applications of scientific knowledge. A superstructure, no matter how perfect, must have firm foundations and thus the development of our industries must go hand in hand with the advancement of knowledge through research.

The organizing committees will recommend to the National Research Council the following plan of procedure, approved by the Council of the National Academy, but open to such modification as the research council may deem desirable:

1. The preparation of a national census of equipment for research, of the men engaged in it, and of the lines of investigation pursued in cooperating Goverment bureaus, educational institutions, research foundations, and industrial research laboratories; this census to be prepared in harmony with any general plan adopted by the proposed Government Council of National Defense.

2. The preparation of reports by special committees, suggesting important research problems and favorable opportunities for research in various departments of science.

3. The promotion of cooperation in research with the object of securing increased efficiency, but with careful avoidance of any hampering control or interference with individual freedom and initiative.

4. Cooperation with educational institutions, by supporting their efforts to secure larger funds and more favorable conditions for the pursuit of research and the training of students in the methods and spirit of investigation.

5. Cooperation with research foundations and other agencies desiring to secure a more effective use of funds available for investigation.

6. The encouragement in cooperating laboratories of researches designed to strengthen the national defense and to render the United States independent of foreign sources of supply liable to be affected by war.

The Research Council follows the line of an organization which has been very potential in the mobilization of Great Britain's resources. The same plan has been followed for many years in Germany and is given credit for the remarkable industrial preparedness of Germany at the outbreak of the war. A further evidence of the efficacy of this systematic organization is the manner in which the German nation has been able to live economically during the progress of hostilities.

It has not been many years since scientific men were not taken seriously by the workmen engaged in many American industries. Even some employers were very loathe to try out various scientific methods of operation. Even yet the rescue crews of the Bureau of Mines encounter some ill feeling when they attempt to supplant the old fashioned methods of bringing men from mines after an accident. "The book miners are killing our men," a crowd of mine workers cried out a few years ago when the Bureau of Mines team was given permission to go into a mine following an explosion. While this sentiment is changing rapidly there are many examples of this woeful lack of cooperation between science and industry. There have been important strides taken during the past ten years, but we are far behind Germany, England and France in this regard, it is pointed out.

In order to systematize the movement, the National Research Council has been doing splendid work. A meeting was held September 20 in New York in which further steps were taken to organize the movement. Van H. Manning, Director of the Bureau of Mines, who is a member of the Council, attended this session. As yet the latest plans of the council have not matured sufficiently to justify their discussion, so that the developments of the recent meeting are not being given out.

The executive committee of the Research Council consists of Dr. John J. Carty, Chief Engineer of the American Telephone and Telegraph Co., Dr. Noyes, Gano Dunn of the J. G. White Engineering Corporation, Dr. Edwin G. Conklin, Professor of Zoology at Princeton University, Dr. Victor C. Vaughan, Director of Medical Research of the University of Michigan, and Dr. Michael I. Pupin, Professor of Electro Mechanics at Columbia University. Dr. Geo. E. Hale, in charge of the Mt. Wilson Solar Observatory, is ex officio chairman of the committee.

DEPTH OF BRISTOL ORE SOMEWHAT IN DOUBT

According to Whitehill, the Bristol district of Nevada was organized April 10, 1871, by Hardy, Hyatt, and Hall. The ore deposits of this region were known in the late sixties, as most of this region had been prospected shortly after the discovery of Pioche, which took place in 1863. A smelter was built at Bristol Well in the late seventies, and later, a 5-stamp mill at the same place. These observations are made by J. M. Hill of the United States Geological Survey after a visit to the region. Others of his observations follow:

In 1877 the Hillside Co., was organized to take over the properties of Mr. Steele, which included the Hillside mine and the well and smelter. At that time the incline on the Hillside fissure was 200 feet deep, and the vein was reported to be 5 to 8 feet wide, carrying ore which averaged $100 a ton in silver and lead.

The Census report for 1880 says that at the Hillside and Day mines galena and cerusite ores in limestone were being mined.

For several years the Hillside and Bristol companies operated the Hillside and May Day deposits on the west side of the range. The Day (Jack Rabbit) mine in Lake Valley was operated independently. These properties and several others near Bristol were consolidated in 1911 by the Day-Bristol Consolidated Mining Co., which, in 1913, was operating the May Day and Gypsy mines and had leased the Inman, Tempest, and Hillside properties. The Day (Jack Rabbit) was idle, and it was reported that the lower workings were below the ore zone. This company at present holds 23 patented claims and 4 locations.

The production of the mines in the vicinity of Bristol previous to 1904 could not be learned, though undoubtedly many thousand dollars worth of silver, lead, and copper were recovered during the period from 1869 to 1904.

The bodies of oxidized copper and lead ores always occur above planes which would interfere with the downward circulation of waters. They usually occur above or south of the northward-dipping, eastward-trending fissures, and on the hanging-wall side of the northward-trending fissures. Most of the few bedded deposits exposed in various mines occur above shaly or dense siliceous beds which have prevented the downward movement of the waters. The deposits so far opened are with little question thought to have been formed by downward-moving waters and are probably the result of a long-continued process. The source of the metals is not clear, as no deposits of primary sulphides have been opened in the district. It may be that deposits of the original sulphides will be found at greater depths on the fissures, but from all that is now known it seems as reasonable to suppose that the oxidized ores were derived from sulphide deposits that have been entirely removed.

Since the ore bodies now being mined were formed by downward-moving waters, it is of some interest to know to what depth they may be expected to continue. It is to be presumed that primary sulphide ores, if any, will not be present in large quantities above the ground-water level. As there are no springs in these mountains, it must be admitted that the water table is lower than the bottoms of any of the canyons. That it is probably considerably deeper than most of the canyons is evidenced by the dryness of the lower workings at the Jack Rabbit mine, which are at least 1,800 feet lower than the lowest workings of the Gypsy.

The possible continuation of the ores with depth is another serious question which can be answered only by development; yet it may be mentioned in this connection that below the 900-foot level in the vertical shaft at the Day mine there seems to have been no considerable mineralization, and that even on the 600-foot level long stretches of the fissure are barren of ore bodies, to judge from the stope maps.

SMALLER PLATINUM PRODUCTION IN RUSSIA IS PREDICTED

The British vice-consul at Ekaterinburg, Russia, reports that the outlook for platinum mining in the Urals would seem to foreshadow an even smaller production this year than in 1915. The abnormal scarcity of the mineral habitually brought in and sold by the small holders at Ekaterinburg has tended to make these people (remembering last year's rapid price fluctuations) very cautious, and most of them now prefer to pledge their mineral with the banks with the idea of waiting for higher prices. The prices ruling at present (June, 1916) are 67,500 rubles per pood ($963 per pound at the normal exchange rate of $0.515 to the ruble) for quantities up to 10 pounds. Larger quantities—1 pood (36.11 pounds) and over—are unobtainable under 68,000 to 68,500 rubles per pood ($970 to $977 per pound). Future prices are largely dependent on the quantities allowed by the government to be exported, for the internal consumption in Russia is not sufficient to influence prices.

The production of asbestos in the Urals in 1915 amounted to 8,689 short tons, or about half of the output in 1914. The sulphuric pyrites mined in the Urals in 1915 amounted to 39,400 tons, the district of Ekaterinburg being responsible for the whole production.

NEW LIBRARY WILL CONTAIN EVERYTHING ON GEOLOGICAL AND MINING SUBJECTS

With Completion of New Building of Department of Interior Space Will be Available for Needed Expansion in Library of Geological Survey—Miss Julia L. V. McCord, Librarian, Important Factor in Assemblying Collection

By far the most complete collection of works on geologic and mining subjects in the world will be that of the United States Geological Survey when the new building of the Department of the Interior is ready for occupancy. The present library of the Geological Survey contains over 100,000 volumes besides the map and pamphlet collections. As it is, this library is the largest of its kind in the world. In the new building, however, the library of the Geological Survey will be combined with that of the Bureau of Mines and extensive additions will be made so as to bring the total number of volumes much higher.

For the past several years the increases in the library of the Geological Survey have been limited to the most essential works owing to the lack of shelf and file room.

In the new building the library will occupy a specially constructed room designed for the particular purpose for which it is intended. It will be equipped with the latest library furnishings. None of the book cases will exceed seven shelves in height, making all volumes readily available without the use of ladders.

The additional floor space, which will be available in the new building, will allow the admittance of a number of works which are not purely geological, but which are of important interest to the mining industry.

Other important geological libraries are maintained in New York by the Engineering Society and in London by the Geological Society of London. The latter is the oldest geological library, but its sets of geological works are not nearly as complete or extensive as those owned by the United States Government.

HAS BEEN POTENT FACTOR IN BUILDING UP LIBRARY

Miss Julia L. V. McCord, the librarian of the Geological Survey, is a Kentuckian. Her education was obtained in the public schools of Louisville and she was graduated from the high school there. Her higher education was obtained at George Washington University, in this city.

From early life Miss McCord took a great interest in science. After finishing her course at George Washington University she entered the service of the Survey. For a time she did secretarial work in the office of Maj. J. W. Powell, who at that time was Director of the Survey.

In 1887 Miss McCord was assigned to work in the library and since that time she has been continuously engaged in this work. In April, 1908, she was made librarian, after having taken a competitive examination.

Photo by Harris & Ewing

MISS JULIA L. V. McCORD

Librarian U. S. Geological Survey

Miss McCord has made a specialty of completing serials of valuable publications devoted to geology and mining. Through her persistent efforts many valuable works, which are not available in any other library, have been secured by the Geological Survey, and in other ways she is constantly adding to the unique value of this specialized library.

Miss McCord is a member of the College

Women's Club, and of the Columbian Women. In the latter organization she has held various offices for many years. She is widely known, due to her correspondence with publishers and scientists, in her efforts to gather all valuable works. She also has addressed the American Library Association and other organizations, which has brought her into prominent public notice.

HILL DESCRIBES MOUNTAINS OF EASTERN NEVADA

Striking features of the eastern part of Nevada are the arrangement of the mountain ridges along northward-trending axes and the wide, flat, barren valleys which lie between the ranges, as described by J. H. Hill of the Geological Survey.

The long, narrow northward-trending ranges are not everywhere of even height but are broken by narrow passes or low ridges into a number of parts, which have received different names. Thus one uplift is known as the Ruby Range in Elko County, as White Pine Range in White Pine County, and as the Grant and Quinn Canyon ranges in eastern Nye County. East of the White Pine uplift is the Egan Range, whose northern continuation in Elko County is the Spruce Mountain group and the Peoquop Range. East of the Egan Range the Schell Creek uplift of White Pine County is continued by the Ely and Highland ranges in Lincoln County. A spur which trends southeastward, known as the Fortification Range and Cedar Mountains, branches from the Schell Creek Range a few miles north of the Lincoln-White Pine County line. One of the most prominent and persistent uplifts in the region here discussed is that which extends along the east boundary of Nevada and is called the Toano Range in Elko County and the Kern Mountains and Snake Range in White Pine County.

The southern end of the Snake Range, culminating at Wheeler Peak, in southeast White Pine County, is the highest part of the ranges in this region, but the Schell Creek and Egan ranges, immediately west of Wheeler Peak, are also high and very rugged. The Ruby Range, in south-central Elko County, is very prominent, its peaks standing well above any of the neighboring mountains. Practically all the ranges have steep eastern flanks, but the slopes to the west as a rule are more gentle. There are some places in all the ranges where the reverse conditions are seen, but in the main the above generalization holds true.

Lying between the mountains there are broad, flat-bottomed desert valleys which, like the ranges, have a northward trend. Eastern Nevada is somewhat better watered than the western and southern parts of the State, and near the mountains, particularly along the east base of the higher ranges, there are many cattle and hay ranches, which obtain their water supply from streams that have their source in the higher hills.

Huntington, White Pine, and Railroad valleys, which lie on the west side of the White Pine uplift, are separated by low, flat divides, and it is hard to realize that they are really not all the same basin. In this line of depressions the ranches are on both margins of the valley, but as the Ruby and White Pine mountains are generally higher than the ranges west of the depression, most of the permanent streams rise in them, and it is only at a few localities that settlements or ranches are found on the west side of the valleys. There are no ranches on the east side of Ruby Valley, for most of the water in this vicinity rises in the Ruby Range. In Sierra and Butte valleys, which are separated by a low divide, most of the ranches are on the east side, along the flanks of Eagan Range. Steptoe Valley is not particularly well watered, though there are a few ranches near Currie, Cherry Creek, Steptoe, and Ely. Antelope Valley is barren. Spring Valley, which lies between Schell Creek and Snake ranges, is well watered, and there are many prosperous ranches along the base of both ranges, though the Schell Creek side seems to be better watered than the Snake Range side except at the south end, near Wheeler Peak.

REPORT SHOWS HIGH GRADE COAL IN VIRGINIA FIELD

A report of the coal resources of the southwestern Virginia district has been issued by the Virginia Geological Survey. This report was prepared by Henry Hines, a geologist of the United States Geological Survey. The work was done cooperatively by the State and Federal Surveys. The report pointed out that the coals of a portion of the coal fields of southwestern Virginia are of coking quality and in general superior to the coals west of the Ohio river or in the greater part of the Appalachian coal field itself. An analysis by the Bureau of Mines of the samples taken by the Geological Survey makes a remarkable showing as to the low content of sulphur, moisture and ash. In some of the beds the coal is comparable with that of the Connellsville basin of Pennsylvania.

ROOF FALLS IN MINES SUBJECT OF SPECIAL STUDY

D. F. McDonald, of the Geological Survey, is making a study of roof falls in mines for the Bureau of Mines. He will make an extended trip, during which practically all of the mining states will be visited. His investigation will be devoted more particularly to coal mines, but he will also make investigations at metal mines.

SAYS UNION HAS NOT MADE WORKMEN MORE EFFICIENT

By S. A. Driver, *Kitts, Kentucky*

Exception is taken by Mr Frank J Hayes, vice-president U. M. W. A., in the Mining Congress Journal of June, to my criticism of the attitude of unionism to the individual responsibility and efficiency of the mine worker.

Mr. Hayes says that statistics show that the loss of life is about three times greater in the non-union than it is in the union mines. This ought to be proof positive that the U. M. W. of A. is one of the greatest agencies in the country today for the promotion of safety in mines.

Fatal accidents in mines may be divided into two classes, common and exceptional, as is shown by Mr. Fay in Bulletin 115 of the Bureau of Mines. Common accidents are those which occur daily, and involve from one to not over four men. Exceptional accidents involve five or more at one time. Explosions, fires, and floods have caused by far the greater part of all deaths due to exceptional accidents, and unionism and non-unionism may be eliminated as a cause of great disasters; but in considering the common accidents which daily occur from falls of roof and coal, reckless use of explosives, ignorance of the requirements of the occupation or carelessness, the personal factor does enter the equation, and statistics show, that the U. M. W. of A., has not made the individual either a more efficient or careful workman. Mr. Fay justly takes the position that it is unfair to a state which works 250 days of nine or ten working hours to compare its accident rate with a state which worked 200 days of eight working hours, and he has therefore reduced his statistics to a 2,000-hour basis.

The following figures give the deaths due to common accidents for each 1,000 men employed on this basis for the 10-year period, 1903 to 1913, inclusive, with the exception of the year 1909

Union States.		*Non-Union States.*	
Illinois	3.04	Alabama	3.80
Indiana	2.88	Kentucky	1.91
Ohio	3.84	West Virginia..	3.83
Wyoming	3.95	New Mexico ...	3.93
Oklahoma	4.46	Colorado	5.29
Kansas	3.83	Pennsylvania ...	2.82

These figures which are taken from Bulletin 115 of the Bureau of Mines must be accepted as standard authority on this subject, and clearly show that the statistician who furnished the figures on which Mr. Hayes based his statement, that the death rate in non-union mines is three times as great as in union mines, made a most serious error in his work.

In the above comparison by states, Pennsylvania and West Virginia are placed in the non-union states for the period under consideration, though there are several union districts in these states, and the union, it must be admitted, seems to be rapidly gaining favor in the eyes of the operators in both of these states. The reports of the state inspectors show that the lowest fatality rate is found in non-union mines. During the year 1914 the H. C. Frick Coke Company employed inside the mines 7894 men and produced 11,723,873 tons of coal with twelve fatal accidents, or a death rate of 1.52 per thousand men and a production of 976,989 tons per life lost.

It should be noted that this 1.52 is the inside death rate per thousand employes, the total number of men employed both in and around the mines for 1914 was 12,942, the total deaths were 16 or 1.23 per thousand. If the record of this company is considered in its entity with respect to the number of employes and production, it will stand above any in the United States.

The Pittsburg Coal Company, whose mines are organized, had 14,826 inside employes in 1914, produced 10,408,149 tons of coal with a loss of 35 lives, or an inside rate of 2.36 per thousand. The total number of employes inside and outside was 16,620. It had no fatal accidents outside, which makes its death rate 2.11, or just the average of the State.

There are small operations which show even better rates than the above corporations, and we fully realize that comparisons are odorous and express the hope that if any officer of the Pittsburg Coal Company should read this, he will be kind enough to think that the comparison is made only to refute the charge that union miners are three times as careful and efficient as non-union.

In West Virginia we find the record for safe operations held by a non-union corporation, the U. S. Coal & Coke Company, which in 1915 produced 1,618,491 tons with 1,643 employes and only one fatality.

For the year 1915 we may compare the non-union state of Alabama with the union state of Illinois. Alabama for this year reports no exceptional accidents and returns 62 fatalities in and around the mines among 25,028 employes, which worked 225 days of nine hours, which gives it a death rate of 2.73 per thousand on a two thousand hour basis.

Illinois reports for the year ending June 30, 1915, 75,606 employes, 180 fatalities, mines in operation 172 days. If we deduct the 52 men killed in the Royalton explosion, and reduce the remaining 128 accidents to a 2,000-hour basis, we get a rate of 2.46 per thousand, which is very little less than the 2.73 rate of Alabama.

The reckless handling and use of explosives is the cause of many fatalities in mines, and the individual element is certainly a factor in these cases. Statistics compiled by Mr. Fay show that for the period ending December 31, 1913, for which continuous records are available, there were killed by explosives for each ten thousand employes in Oklahoma, 8.60; Illinois, 3.40; Indiana, 4.20; Kansas, 6.81, Alabama, 2.70, and Colorado, 2.25. The first four are union, the last two non-union.

The miners, both organized and unorganized, but especially the organized, have fought the use of permissible explosives, notwithstanding the fact that the death rate from explosives has been reduced from 3.7 per ten thousand employes in 1903 to a little less than one per ten thousand in 1915, which reduction has kept pace with the increased use of permissible. Furthermore the increased safety due to the handling of permissible is only a small part of the increased safety due to its use. Good union miners, whose word I trust, and whose friendship I value, have told me of mines at which they worked in Indiana and Oklahoma being closed by strikes on account of a shot firer refusing to fire a shot which he considered unsafe. A strike followed the posting of Safety First notices in a Western mine.

The introduction of machines in mining is and always has been opposed by the union, though their use increases his earnings and safety, as is shown by the Illinois report for 1914 and Bulletin 115.

The miners of Wales are among the most closely organized in the world; the Welsh miner is as an individual workman the peer of any miner in the world, yet the production per man is among the smallest in the world, his union prevents his realizing the proper return on his ability and skill.

The mine workers' organization has among its various local and general officials many men of unusual mental capacity, among whom are born leaders of men, and when they devote their talents and energies to making the miner a safer and more efficient workman, a better man and citizen, the miners' union will become one of the most powerful agencies for good in the industrial world. But at present I see no reason to change my belief that its principal tenet is "Do less and ask more for it."

MINING REVIVING IN CHERRY CREEK DISTRICT OF NEVADA

The first discovery of ore in the Cherry Creek region of Nevada was made in 1861 on the Gilligan vein, in Egan Canyon, by John O'Dougherty, one of a party of immigrants who were following the Overland Stage Route to California. He built the first mill in Nevada in 1864 to treat the ores of the mine. Stretch reports that the total production of the mine up to 1866 was $60,000.

The records of the Gold Canyon mining district begin in 1863, but the first entries are of bills of sale of previously located claims. In 1874 and 1875 Gen. Rosecrans was operating the Gilligan vein for the San José Mining Co. The Cherry Creek district was cut off from the Gold Canyon district in 1872, J. M. Hill of the Geological Survey records.

The first claim recorded in the Cherry Creek district was the Teacup, located September 21, 1872, by John Corning and Peter Carpenter.

It is said that the mines of this district were most actively worked between 1872 and 1883, during which time the population of Cherry Creek was about 6,000. There was also a fair-sized town at the head of Egan Canyon up to 1877. In 1884 mining began to wane, and in 1893, with the demonetization of silver, it practically ceased. Since 1895 some work has been done at various properties by different companies, particularly at the Star, Exchequer, and Biscuit mines.

The production of the early days is not known, though estimates range from $6,000,000 to as high as $20,000,000.

There are two somewhat overlapping types of veins in the Cherry Creek (Egan Canyon) district. One type, represented by the Wide West, Cocomongo, and possibly the McMurry prospect, has its principal value in gold, carried in a white quartz gangue that shows a minor amount of pyrite and less galena. The other and by far the most important in the district is represented by the Exchequer, Star, Biscuit, Cherry Creek, and Gilligan veins, which carry galena, sphalerite, pyrite, and rich secondary silver minerals. That there may be a transition between these two types is strongly suggested by the Exchequer-New Century vein, in Exchequer Canyon, north of Cherry Creek. West of the canyon, on the Exchequer ground, the quartz carries the base-metal sulphides and contains more silver than gold; and east of the canyon, on the New Century ground, what appears to be the same vein is not strongly mineralized, but carries pyrite, gold, and silver. It may be that the gold and silver bearing portions of the veins are those parts which have not been strongly mineralized, and that the ore shoots will all prove to be of the lead-zinc type, carrying more silver than gold. In both types the veins are strong in the quartzites but tend to finger out where the fissure enter argillaceous shales. This is particularly well shown on the Gilligan and Star veins.

At the upper tunnel on the Cherry Creek Co.'s property the ore body is a mineralized quartz monzonite dike carrying galena, sphalerite, and pyrite. It is evident that the dike was metallized after its consolidation, and it is believed that most of the veins of the district were formed shortly after the intrusion of the quartz monzonite.

The lead-zinc veins have been crushed since the deposition of the original ores and have been enriched by descending waters which have deposited rich silver minerals such as argentite, prousite, and an antimonial silver-lead-copper mineral of uncertain composition. The enrichment of the Star vein, as indicated by the largest stopes, was greatest between the third and seventh levels but extended to a depth of 600 feet vertically below the croppings. At the Biscuit mine argentite and copper carbonates are said to have been found to a depth of 1,100 feet on the dip of the vein.

WOODBRIDGE REPLIES TO ORE-SAMPLING CRITICISMS

Replying to a communication published in the September issue of THE MINING CONGRESS JOURNAL, T. R. Woodbridge says:

"In the September issue of the JOURNAL I note extracts from a communication from Mr. Meyer concerning ore sampling. The statement credited to me in the August issue is merely a portion of the foreword of a report I have made for the Bureau of Mines on Ore Sampling Conditions in the West, to be published as Technical Paper No. 86, and was therefore but the briefest outline of some general conclusions.

"If Mr. Meyer should care to read the full report he might find that we do not differ so very much in the essentials of sampling practice, and I therefore prefer not to discuss his remarks very fully at this time. There are, however, a few statements I wish to refer to now.

"Referring to No. 3, I do not recommend one single method of sampling, but do urge the standardization of such methods, whether hand or machine, as individuals may use.

"In No. 5 the expression, 'larger or smaller discrepancy,' is rather indefinite, but if it means that with high-grade ores the sampling and assay differences are always disturbingly large, it is contrary to my experience.

"In No. 6 the desirability of the amount retained depends entirely on how closely it represents the original shipment. One per cent in one plant might be safer than 25 per cent in another plant. Custom sampling plants usually retain the whole lot, but this practice does not seem feasible in mills or smelters.

"In No. 7 we find the nub of the whole matter in the phrase, 'if also proper care is taken that the proportion of fine and coarse material is maintained in the sample." How is one to determine this 'proper proportion?' And how 'maintain' it after it has been discovered? If we substitute the words, 'gold and silver' for 'fine and coarse material' we have a transformed phrase reading, 'if also proper care is taken that the proper proportion of gold and silver is maintained in the sample.' And this, forsooth, is our original problem.

"As to No. 8 we have to confess that our moisturing methods are compromises and, as usual with compromises, are causes of much dissatisfaction between buyer and seller. I cannot see the same necessity in the weighing.

"No. 9, does not come within the scope of my report, though I don't mind saying personally that I have not yet become convinced that making a man a government employe acts like the baptismal service in expelling the Old Adam from his system.

"I am very glad to see these statements from Mr Meyer, even though my full report was not available, for the more fully this report is discussed and criticised the better pleased I shall be. During my experience in sampling, covering several absorbing and even fascinating years of study of sampling systems and experimenting with various ores in many mining camps, I have naturally come to certain definite conclusions; and my former associates and customers will doubtless recognize some former arguments. Nevertheless I have tried to be in a receptive mood during this investigation, and to show conditions as they are, and at the same time to make suggestions for their possible improvement.

LITTLE DEVELOPMENT BEING DONE AT DOLLY VARDEN

Following a visit to the mining districts of eastern Nevada J. M. Hill, of the Geological Survey has the following to say concerning the Dolly Varden district:

So far as could be learned, the first discoveries of mineral in the Melrose (Dolly Varden) Mountain were made in 1869, at the silver-lead mines in the southeastern hills, near what was called Hicks Spring, later Last Chance Spring, and now locally Dolly Varden Spring. In 1872 the copper ore at the Victoria was opened and for about two years was actively worked, the ores being smelted in a Mexican furnace at Dolly Varden Spring. Since the closing of the Victoria mine development in the district has been slight. Some excitement was caused by the discovery of the gold-bearing veins in the Mizpah section in 1905, but it was apparently short lived. Small shipments of ore have been made from time to time frome the Victoria dump, and a little lead-silver ore has been extracted from the mines east of Castle Peak. In September, 1913, there were about ten prospectors in the mountains. One company had been operating a churn drill for a couple of years, but at the time of visit it was understood that the work was to be discontinued.

The production from the Victoria, Keystone, Eugene, and Hidden Treasure mines in the early days can not be learned, but it appears not to have been large.

The deposits of the Dolly Varden district are clearly related to the quartz monzonite intrusive. They occur as contact-metamorphic and replacement deposits in the area of Carboniferous limestones and shales at the south end of the mountains and as veins in the intrusive rock in the vicinity of Mizpah.

The deposits in the sedimentary area are of two well-defined types. Oxidized copper ores, presumably derived from original deposits of pyrite and chalcopyrite, are usually associated with the lime silicate minerals and are nearer the instrusive contact than the lead deposits. The latter, found only in the extreme southeast part of the district, are typical replacements, both as fissure and bedded, occurring near fissures in limestone.

The ore minerals of the copper deposits so far developed are all of the oxidized variety, though kernels of the original chalcopyrite and pyrite remain at many places, and at not a few localities, where development has penetrated below water level, slightly cupriferous pyrite is seen to be the chief original sulphide. Chrysocolla, copper pitch ore, and malachite are most abundant, though chalcocite can usually be seen in the richer specimens of ore and bornite is exceptionally present. Limonite, as is to be expected, is present in abundance in all the copper deposits. The gangue minerals are quartz, green garnet, light-green biotite, and tremolite (with calcite and actinolite at some localities). The metamorphism due to the intrusion of the quartz monzonite magma has not been as intense as in some districts, and the croppings of the lime silicate zones and ore bodies are few and small.

It seems rather doubtful if any large bodies of enriched chalcocite ore will be found in this area, as the water table is near the surface—90 feet at Moore's shaft and 60 feet at the Anchor mine. At Moore's shaft the zone of chalcocite ore has apparently been traversed and is reported to be very narrow. At the Anchor mine the shaft is now at the water level, but the chalcocite zone has not yet been reached.

The original ore apparently contains only a small proportion of copper-bearing minerals. The same remarks are pertinent to the deposits of the Iron Duke and Franklin group and to those of prospects a short distance west of Watson Spring.

The argentiferous lead-bearing replacement deposits in the vicinity of Castle Peak are closely associated with north-south fractures cutting the limestones, along which the ore-bearing solutions have evidently moved. The principal minerals of these deposits, all of which are silver bearing, are cerusite, anglesite, and residual kernels of galena. Here and there a little copper carbonate stain is seen.

Small quartz veins characterized by chalcopyrite and minor pyrite and bismuthinite are typical of the veins in the intrusive rock. They are gold bearing, and some free gold is said to occur in the veins near Mizpah Spring. The solutions which deposited the veins have also altered the adjacent quartz monzonite, though usually in very narrow zones. Few such bands of sericitized and calcitized rock are over a foot in width, and most of them measure only a few inches.

At one place one-half mile east of Mizpah Spring an irregularly shaped body of thoroughly altered quartz monzonite about 300 by 200 feet in maximum dimensions somewhat resembles the croppings of the upper leached portion of the "porphyry copper" deposits.

HEALTH PRECAUTIONS PAY EMPLOYERS AND EMPLOYES

Washington Post.

Many of the greatest reforms have been brought about by interest that could not be described as wholly altruistic. It is no reflection upon human nature to say that self-interest, the desire to stand forth as a leader or win a place in history, has prompted many of the greatest achievements in behalf of humanity. It was self-interest that led many of the largest corporations in the country to establish pension retirement systems for their employes, yet no one can say that the motive detracts from the substantial human reform that has been accomplished.

It must be admitted therefore that the Bureau of Mines is approaching the problem of health conservation from the right angle when it accentuates the financial saving which accompanies such conservtion. From a human standpoint, there is no question of the importance of the prevention of the conditions productive of ill health among workers. When the employers realize, however, that there is a vast financial saving involved they will establish the reform as a business economy as well as a benefit for individuals.

The bureau of mines points out that the average loss of time due to illness among approximately 30,000,000 workers is nine days a year. If medical attention be estimated at $1 a day and earnings at $2 a day, this loss amounts to nearly $880,000,000 annually.

This, however, is the loss that is borne by the workers. Nevertheless, since every man that works must earn a profit for the employer, it can readily be appreciated that the loss to the employer is almost as great as the loss to the employes. If all mills and factories were to close down for nine days, the loss in commerce would be much greater than $880,000,000. It would be estimated in the billions.

As the dropping out of the employes is not simultaneous, however, the loss is not so great, but surely it is large enough to warrant a considerable investment in health precautions. Industrial efficiency depends on the workers, and health is the workingman's capital and stock in trade. Captains of industry everywhere should take note of the recommendation of the Bureau of Mines in favor of a system of medical supervision to prevent introduction and spread of contagious diseases and an examination of all candidates for employment and of men already employed, so that those physically or mentally defective may be identified and given medical attention.

GOVERNMENT EXPERTS WELL KNOWN TO MINING MEN

Photo by Harris & Ewing

E. S. LARSEN, Jr.

Geologist

E. S. Larsen, Jr., was born in Astoria, Ore., March 14, 1879. He was educated in the public schools of Portland and is a graduate of the high school there. His higher education was obtained at the University of California, from which institution he was graduated in 1906 with a degree of B. S. Afterwards he took one year of post-graduate work at the University of California. One summer during his attendance at the university Mr. Larsen worked with a field party of the Geological Survey in southern California.

Following the completion of his school work Mr. Larsen came to Washington, where he became connected with the Geophysical Laboratory of the Carnegie Institution. He spent two years in this work as assistant petrographer.

In 1909 Mr. Larsen came with the Geological Survey as an assistant geologist. He attained the rank of geologist in July, 1914. He is at present in charge of the sub-section of petrology, which makes necessary considerable office work in Washington. He is able, however, to find time for some field work and has done extensive petrographic work in Colorado. He also has conducted some investigations of the same nature in California and Montana.

RICHEST ORE CONTAINS ONLY THREE GRAINS OF RADIUM TO TON

Radium-bearing minerals are found in commercial quantities in the United States in Colorado and Utah. In Colorado a small area near Central City, Gilpin County, carries pitchblende, which is a uranium oxide carrying minor quantities of other elements. Carnotite is, however, the principal radium-bearing mineral and is found in southwestern Colorado and southeastern Utah.

Pitchblende is, as its name will indicate, a black, pitchy mineral. It has a very high specific gravity, almost as high as iron. Carnotite is a bright canary yellow and generally a powdery mineral. Practically all of it occurs in the area mentioned in a soft sandstone.

So far as is known, radium is in the elemental condition in these minerals. It must be understood, however, that radium occurs in such minute quantity that it is never visible as found in the ore. The richest ores known contain less than three grains of radium per ton, and owing to the rapidity with which it changes into other elements it is not probable that radium will be found in greater quantities.

TAMPICO DISTRICT REGARDED AS GREATEST OIL FIELD

Without question the Tampico district of Mexico is the most wonderful oil field in the world in the proportion of successful to unsuccessful wells, in the opinion of E. W. Shaw, of the Geological Survey, who has just returned from a business visit to Mexico. He reports that the most intense competition exists between companies in the matter of making locations, despite the very unsettled political conditions in Mexico.

Owing to the disturbed condition of the country the production in the Tampico region is being held as low as possible. If the conditions were favorable the production of this field would be increased very materially, Mr. Shaw reports.

SURVEY OIL SPECIALISTS GO TO SOUTH AMERICA

G. C. Matson, of the Geological Survey, has been granted a short leave of absence, during which he will visit Colombia and some of the Central American republics for a large oil company. He will do general scouting work. G. S. Rogers, of the Survey, will assist Mr. Matson.

Latest Traffic Developments

Iron Ore Cases Decided

In the iron ore rate cases the Commission found that:

1. With certain exceptions, upon the whole record, (*a*) that the present groups, both of the lake ports and of the points of destination, are, and for the future will be, unreasonable and unjustly discriminatory within the meaning of sections 1 and 3 of the act to the extent that they differ from those herein found to be reasonable; (*b*) that the rate relationships of the several destination groups are, and for the future will be, unreasonable and unjustly discriminatory to the extent that they depart from those herein fixed; and (*c*) that the rates at present maintained and here under consideration are, and for the future will be, unreasonable and unjustly discriminatory to the extent that they exceed the rates herein shown as reasonable maximum rates.
2. Carriers required to establish separate charges for storing ore on their docks and for certain other dock services performed by them, also for switching and other services on private industry tracks. Reasonable maximum rates prescribed for the dock services, and a charge on the engine-hour basis suggested for the services on the private industry tracks.

Chicago Divisions Unchanged

In the matter of advances on coal within Chicago switching district the commission says:

In the original report in this proceeding we held that the respondents had not justified proposed increased rates on coal and coke from mines in various states to points on the line of the Chicago, Milwaukee & St. Paul Railway in Chicago. The carrier named performs only a terminal service in Chicago on this traffic. It now asks that we fix the division which it may receive out of the through rate. We hold that upon the whole situation the commission does not feel justified in ordering a basis of division different from that now existing.

Coal Rate Increase Denied

In the matter of coal to Red Wing, Minn., the commission holds:

1. The Chicago, Milwaukee & St. Paul Railway Company denied authority to maintain a rate on coal from Chicago and Milwaukee to Red Wing, Minn., lower than to intermediate points.
2. Chicago Great Western Railroad Company authorized to establish a proportional rate from Chicago and points taking the same rates, on bituminous coal in carloads, when originating at points in Kentucky and West Virginia, to Red Wing, Minn., the same as the rate maintained by the Chicago, Milwaukee & St. Paul Railway Company from Milwaukee to Red Wing, and to maintain higher rates at intermediate points between, but not including, Alta Vista, Iowa, and Red Wing.
3. Orders of suspension vacated.

LACK OF SHIPS HOLDS DOWN EXPORTS OF LEAD

The average difference between the prices of lead at New York and at London for the 10 years prior to 1914 was not far from 1½ cents per pound, the price at New York being the higher according to C. E. Siebenthal of the U. S. Geological Survey. This being the case, exports of domestic pig lead should be expected only under temporary or very unusual circumstances. The practice of the Bureau of Foreign and Domestic Commerce has been to class all exports of lead articles manufactured in this country as domestic exports, whether the lead be of domestic or foreign origin. For this reason no table of exports of domestic lead manufactures has been given, because such a table must have duplicated the table of foreign lead in manufactures exported with benefit of drawback. Since the exports of domestic pig lead began, however, they have been shown separately.

In 1914 the price of lead at London rose above the price at New York early in January and consistently remained between one-fourth and one-half cent per pound above throughout the year. This made it possible to export domestic lead at a profit, and the decrease in imports of lead ore and bullion from Mexico rendered it necessary to satisfy the foreign demand with domestic lead, the exports of which assumed large proportions. The movement commenced in March, 1914, and by the close of the year 58,722 short tons, valued at $4,501,674, had been exported. Likewise in 1915 the price of lead at London was from one-fourth to 1 cent a pound higher than the price at New York, except for the period of high prices in the United States during June and July. Exports of domestic lead continued heavy throughout the year, reaching a total of 87,092 tons, valued at $7,796,998. The exports were probably held down to a certain extent by the lack of shipping facilities.

WILLIAMS RETURNS FROM VISIT TO OIL FIELDS

W. A. Williams, chief petroleum technologist of the Bureau of Mines, has returned from an extensive visit to the principal oil fields of the West. The trip mainly was to gather information before planning the Bureau's work for the coming year. On his trip Mr. Williams visited fields in California, Wyoming, Montana and Oklahoma.

THE
MINING CONGRESS
JOURNAL

Published Each Month by
THE AMERICAN MINING CONGRESS.
Munsey Building. Washington, D. C.

Subscription Rate, per year............. $2 00
Single Copies......................... .20

Entered as Second Class Matter January 30, 1915, at the Postoffice at Washington, D. C.

OCTOBER, 1916

EDITORIALS

CONSERVATION PLAN TO BE CONSIDERED.

After years of restriction of the development of Western mineral resources by land withdrawal orders "in aid of legislation," Congress has again adjourned without definite action.

The public sentiment which a few years ago seemed to demand drastic and almost revolutionary changes in the control of our mineral lands, has gradually lost some of its ardor, and has begun to see that the policy of Lincoln after all did not contain so much that was vicious.

The Ferris land leasing bill, which passed the House by a very large majority, was so amended by the Senate Committee as to call forth Mr. Pinchot's severe criticism, although it recognized the leasing principle, but also provided for the relief of the California oil claimants, whose rights had been initiated under the provisions of the existing Land Office regulations.

In the meantime, the American Mining Congress has been urging a bill for the appointment of a Congressional commission, which by public hearings throughout the West, should determine what changes in the law are necessary, and make recommendations to Congress.

The original plan was that this commission should investigate the whole mineral land problem, but the conservation program undertook to deal with the fuel minerals and water powers, leaving the proposed commission to deal with the metalliferous deposits only. This bill has been passed by the United States Senate, but has failed in the House of Representatives.

The great difficulty has been that the West has had no comprehensive policy, and even western Representatives in Congress could not get together upon an intelligent and comprehensive plan for handling this situation. The belief that those resources which are essential to industrial prosperity should not be permitted to pass beyond public regulation must be considered, but it must also be recognized that the individual States must have the benefit of their own natural resources.

In view of the present legislative situation the Mining Congress feels that the time is opportune for a campaign to re-open mineral resources to development, to protect the interests of the States, to meet the eastern criticism against fuel and power monopoly and to work out a perfect conservatism, viz: the highest use and the least possible economical waste of the great mineral resources of the West.

How can the most intelligent effort be made in this behalf? This plan may meet the situation:

> That each of the Governors of the Rocky Mountain States shall send a special delegation of representative men to meet at Chicago, in conjunction with the American Mining Congress convention in November, instructed to give thorough consideration to this subject and to formulate the most comprehensive policy which can meet general approval.
>
> That the discussions of western subjects by the convention shall be such as to lend color to the more conservative work of the special commission, and thus secure for its work the attention of the press and public.
>
> That the convention as a whole (which will include strong delegations from States having several times as many representatives in the House as the Western States) shall be asked to approve resolutions embodying the recommendations of the Special Commission.

MINE SAFETY

In an article by Mr. S. A. Driver published in the July issue of the Mining Congress Journal, it was contended that the burden of mine safety work during the last few years in the United States had devolved upon the mine operators, and that the miner himself had not met his full share of the responsibility. Mr. Driver pointed out that 52 per cent of the accidents in the coal mines resulted from the fall of roofs and asserted that these accidents largely could have been prevented by reasonable care on the part of the miner, whose duty it is to place props in position to prevent such accidents, the operator being required, under severe penalty, to provide the necessary props.

This charge was not made as against union miners, but against all miners, the statistics being more or less general from which the data was taken.

Mr. Frank J. Hayes, in a later issue did not reply to the main issue, but pointed out that the record for mine safety is much better in those districts where union labor is employed than elsewhere. In another column Mr. Driver disputes this statement and gives statistics to prove his contention. The real question which should be considered is what further steps can now be taken to further lessen the loss of life in mining operations.

The fixing of responsibility upon either operator or miner is only of value when in finding out we may provide a remedy.

The great purpose of the Mining Congress' work is to reduce the number of accidents in mining operations. It is important to know the cause of accidents, and where the negligence of either operator or miner tends to increase accidents, every effort should be made to prevent the negligent acts, through which accidents are brought about. The operator is penalized when he fails to give proper props to prevent the falling of roofs. If he fails to meet this requirement he should be punished for his negligence. Upon the other hand, having met his responsibility, if the miner is negligent, there should be some method of requiring him to exercise the highest degree of diligence in this respect.

The miner, perhaps, may have the right to risk his own life from a purely personal standpoint, but he has not the right to gamble with the support of his family, nor gamble with the obligation of his employer to recompense his family in case he is injured or killed.

If Mr. Driver's contention is well-founded it would seem advisable that the negligence of the miner himself should be punished by severe penalties.

The great safety campaign, by the Federal Government, by State organizations, and by mining companies has accomplished big results but much yet remains to be done.

Fifty-two per cent of the total accidents in coal mines resulting from one cause as against 48 per cent from all other causes, including explosions, would seem to indicate that this is the most fruitful field in which to work out better conditions. What is the remedy? Our columns are open for a discussion of this subject.

THE PUBLIC LANDS QUESTION

Whether the Ferris Land Leasing Bills shall be enacted or whether the amendments made by the Senate committees shall prevail is of vital importance to the West.

Whether the oil claimants of California whose rights are based on a compliance with the U. S. land office regulations then in force shall be robbed of their property without right of appeal to the courts as the Alaskan coal claimants have been is of vital importance to every loyal citizen.

Whether the resources of the West are to pay endless tribute to the national Government through a Federal leasing system or whether these resources shall be subject to the taxing power of the States concerns directly every tax payer. Whether a cumbersome agency two thousand miles away without knowledge of conditions shall control Western development or whether the basic principle of republican government, home rule, shall prevail and our development be controlled by those who know, is the most important and pressing question now facing the West.

The coming session of Congress will probably finally pass upon these questions. The leasing bills have passed the House of Representatives and are now before the Senate. Western Senators are entitled to great credit for the work thus far accomplished. The Senate is likely to approve the work of its committees but unless the West shall rally to the support of the Senate committee recommendations, there is grave danger that the House of Representatives will refuse its approval.

The Chicago convention will give full consideration to this important question.

LACK OF FUNDS HAMPERS PROSPECTING FOR POTASH

Congress always is rather remiss when it comes to consider appropriations which will benefit the mining industry. This is the more apparent when mining appropriations are compared with appropriations looking to the advancement of agriculture.

Two very necessary expenditures have been pointed out to the appropriations committee on several occasions by the Director of the Geological Survey, but the committee has not seen fit to act upon his suggestion.

Since the beginning of the war in Europe great losses have been suffered in the United States and in other parts of the world due to the isolation of the great potash producing area at Stassfurt. As is set forth in the news columns of this issue, certain portions of our own territory are very likely to contain potash deposits similar to those found in Germany. Regardless of the urgency of discovering potash deposits, Congress has refused to allow more than a paltry $20,000 for this prospecting work. Twenty thousand dollars is only enough to make one drill hole to the depth necessary to make an adequate exploration. Of course this sum must pay for various expenses other than drilling. For instance it is necessary to have a high-salaried scientific man at the well at all times in order to make an immediate examination of all matter being passed through by the drill.

The other matter in which Congress is being penny wise and pound foolish is that of not allowing expenses for sending Government representatives to the meetings of scientific societies. In this connection Dr. Smith made the following statement before the appropriations committee of the last session.

> Such attendance is, in my opinion, important if not essential in connection with the regular official work of the Survey. As it now stands, a member of the Survey who in the line of official work attends such a meeting does it at his own expense. In some cases we consider it so important that we incur that expense and pay it ourselves. It is not in any sense in the nature of a junket.
>
> At the meeting of such professional societies are gathered the very men that we want to meet in connection with some specific part of the official work, and it is cheaper to visit six men at one place rather than the same six men at four, five, or six places; and that is the time they gather together. Such a meeting is that of the American Institute of Mining Engineers, every meeting of which that I can attend, I do attend. At the present time it involves some personal expense to myself, but, worse than that, it prevents the attendance of some other members of the Survey that I would like to have attend such meetings.
>
> They are for the discussion of technical papers, but the most important thing is that the men that we wish to see, the mining engineers from all parts of the country, gather there. For instance, in the collection of our mineral statistics the mining men are the men upon whom we have to depend to furnish those statistics, and I should like to see a half dozen of the men who are engaged in our work attend such a meeting as I attended a few weeks ago at New York, so as to talk over the work which is now done by correspondence.
>
> As a regular incident of the Survey work one of our statisticians or geologists will go from here to Pittsburgh or from here to some other industrial center to see one of these men and it may be to another point to see another man. Other meetings of similar character are the meetings of the West Virginia Coal Operators, American Fertilizer Association, Lime Burners' Association, American Mining Congress, and last summer I attended some of the engineering congresses at San Francisco. I feel that I was there not simply as a delegate appointed by the Secretary of the Interior and the President, but that I was there in connection with the offi-

cial work of the Geological Survey, but under the existing statute, which prohibits that kind of a thing, except for a few of the bureaus, I was compelled, as were other members of the survey who were in that vicinity and who attended those meetings, to pay the expenses, as we were not allowed to include the expenses incurred in attending such meetings in our official accounts.

It is to be hoped that Congress at the next session will recognize that the attendance upon technical society meetings is a legitimate and indeed an essential part of the public service to be rendered by scientific bureaus which are devoting their principal effort to the benefit of the mining industry. It is very easy to safeguard such a privilege from abuse if Congress should feel that such a safeguard is necessary.

COMPULSORY ARBITRATION

One of the most important questions requiring attention by the American people is the compulsory arbitration of disputes in which the public has a direct interest often greater than the interest of the parties to the dispute.

Nearly all disputes between individuals or communities are already subject to compulsory arbitration. The individual who attempts by stealth or violence to right his own wrongs becomes at once a criminal subject to arrest and punishment.

This condition prevails as to individuals whose dispute may be no possible concern to any one else. Obedience to law is the first duty of every citizen and the price he pays for the protection of the law. Failure to receive this protection justifies his refusal to respect the law. A public service corporation is bound to furnish its service to all who meet its reasonable requirements. It is the right of every citizen to demand that all of the usual channels through which the necessities of his existence are supplied shall not be intentionally interferred with.

Any baker in the city of Chicago has a perfect right to suspend operation, but if all the bakers of Chicago by concerted action (*i. e.,* conspiracy) shall close up their shops at the same time the courts would quickly interfere to punish the conspiracy.

The baking of bread is not a public utility. Bake shops are not even a public necessity. Individual baking facilities are easily acquired and each person can bake his own bread. Bake-shop service may not be a commodity. Notwithstanding this, if the bake-shop proprietors by concerted action shall shut off the usual supply of bread the law would quickly assert itself.

By what theory of justice or equity have the bakers a right, through a union or otherwise, to bring about a result which, if brought about by the proprietors, would subject them to severe penalties?

In those cases of dispute where the interest of the public is materially affected, the right of that public seems evident to insist upon some method of settlement which will not too greatly prejudice its rights.

MINING LAW REVISION

The next session of Congress will have under consideration the Foster bill for a revision of the mineral land laws of the West.

It will be remembered that a bill for a commission to investigate Western conditions by public hearings in the Western mining centers and to make recommendations to Congress was passed by the Senate but failed to receive the approval of the House Committee on Mines and Mining. In its stead Dr. Foster, the chairman of this committee introduced a bill intended to meet the requirements without the preliminary work of a commission. This bill has been severely criticized by the West and by mining trade journals.

A thorough discussion of this subject will take place at the Chicago convention.

Dr. Foster will lead the discussion in favor of the plan which he proposes to meet the continuous demand of mining men for a revision of the mining laws.

A plan of future action will be outlined by the convention and a campaign begun to bring about practical legislation or to continue the present conditions.

APPRECIATION OF BUREAU OF MINES SAFETY WORK SEEN IN RESIGNATIONS

Edward Higgins and G. W. Riggs, two of Bureau's High Salaried Specialists, Accept Service with Private Organizations—Former Goes with Group of California Companies, Latter with Nevada Operators' Association

A striking indication of the increasing interest on the part of private mining enterprises in safety work comes with the announcement that Edward Higgins, of the Bureau of Mines, has been employed by a group of California companies as a safety engineer. Mr. Higgins has represented the Bureau of Mines in its cooperative agreement with the California Industrial Accident Commission and has done remarkable work. That he left the service of the Bureau is the cause of very sincere regret on the part of the director and other officials of the Bureau.

Since a small group of private companies has seen fit to offer Mr. Higgins twice the amount of remuneration he was receiving from the government they realize that Mr. Higgins could not afford to refuse to grasp such an opportunity. At the same time, the officials of the Bureau of Mines see in this action the strongest possible endorsement of the work they have been doing in the interest of safety in mining operations.

OPPOSED AT FIRST

When the safety work was first undertaken by the government it met with very general opposition. In some quarters this opposition amounted to active hostility. It was regarded as an unwarranted interference with the rights of private enterprise and even the more generously inclined thought that the work would be meddlesome and unproductive of good. Through the exercising of splendid tact and by proving in innumerable instances the practicability and advisability of the safety measures advocated by the Bureau, the opposition has disappeared almost entirely. Safety engineering has become a recognized profession. Men who have demonstrated their ability in this activity are in demand among mining companies and the number employed is increasing constantly.

Mr. Higgins has demonstrated an unusually high grade of ability as a safety engineer. He undertook a very difficult problem in California and succeeded with it beyond all expectations. The fact that he is to be connected with a group of important mining companies in California is expected to do much toward broadening the cause of safety work.

ANOTHER RESIGNATION

Another resignation was that of G. W. Riggs who has become safety engineer for the Nevada Operators' Association. He will organize safety work and train men in rescue and first aid work in the mines of the members.

The Nevada Operators' Association called upon Director Manning of the Bureau of Mines for a suggestion as to some safety engineer who could do this work properly. Mr. Manning suggested the name of Mr. Riggs as he is doing work in that district and is well known to most of the operators with whom he would have to deal. Mr. Manning expressed the keenest regret at losing Mr. Riggs' services, but he feels that just at this time, when the operators are beginning to employ safety engineers, that every effort should be made by the Bureau to see that efficient men are employed. In case a group of operators should by chance employ an unscrupulous or incompetent man the influence might be very hard to overcome, it is recognized.

CAR SUPPLY FIXES OUTPUT OF MINES IN MIDDLE WEST

The output of mines in Indiana and Illinois is being limited by a car shortage according to Geo. H. Ashley of the Geological Survey, who has just returned from a visit to these states. Coal operators, he declares, resent the diversion of coal cars to other uses. Since some other classes of freight are more profitable the coal mines are being deprived of a considerable number of cars that could be put at their disposal, it is claimed.

While in Illinois Mr. Ashley, together with E. O. Ulrich, George H. Girty and Charles Butts of the Geological Survey, Frank De-Wolf, the State Geologist and Prof. Stewart Weller of the University of Chicago, an effort was made to settle a geological question of long standing. The question is the determination as to whether certain rocks are Chester or Ste. Genieve. This problem has been the subject of considerable work on the part of the State Surveys of Kentucky, Tennessee, Missouri, Illinois and Indiana. It is quite important that it be settled as it has an important bearing on determining structures showing the possible occurrence of oil. The solution of the problem would have other economic values as well.

Latest Mining Patents

Process of Extracting Alkali-Metal Compounds. No. 1,197,556. This invention is by Henry B. Slater, of Riverside, California.

This invention relates to a process of extracting alkali metal compounds from minerals and mineral residues containing alkalis.

One object of the invention is to obtain alkali, particularly potash, from minerals and mineral residues containing alkali compounds. Another object is to obtain the alkali referred to, by treating the mineral or minerals residue with a solvent rich in chlorides of higher form so as to produce the alkali in the form of chloride. The invention is applicable to the recovery of potash from feldspar and other minerals containing potash and also to the recovery of potash from mineral residues such as the flue dust of cement and other works.

Method of Extracting Precious Metals from Their Ores. No. 1,198,011. This invention is by Thomas B. Crowe, of Victor, Colo., Assignor to the Portland Gold Mining Company of Colorado Springs, Colo., a Corporation of Wyoming.

This invention relates to the extraction of precious metals from their ores and particularly to extraction by the so-called cyanide method, although the invention is not limited to the use of any particular solvent. A method is devised which consists essentially of applying a pressure greater than atmospheric pressure to the mixture of solvent solution and ground ore during the agitation of same.

Apparatus for Roasting and Sintering Ores. No. 1,197,199. This invention is by James Gayley of New York, N. Y., Assignor to American Ore Reclamation Company of New York, N. Y., a Corporation of New York.

This invention relates to the improvement in the construction of sintering machines, more particularly those of the Dwight and Lloyd type, in which continuous traveling grates made up of articulated elements or pallets are moved over a suction or wind box to produce through a body or ore contained in the pallets a down draft which roasts or sinters the ore after it has been ignited at the surface.

Apparatus for Washing Coal and other Minerals. No. 1,197,932. This invention is by Paul Habets, of Montegnee, near Liege, and Antoine France of Liege, Belgium.

This invention relates to an apparatus for washing minerals for the purpose of separating out the denser material, for instance apparatus for washing coal so as to separate out the schist or heavier stony material from the coal proper. The invention refers more particularly to that type of coal washing apparatus wherein a stream of water is guided by suitable means, such as a trough or launder so as to entrain with it the mineral to be washed, the entraining stream carrying the mineral to suitable means for separating the schist from the coal. The object of the invention is to enable the schist to be discharged from the separating means by devices which will prevent the waste of water or will reduce to a minimum the amount of water discharged with the schist.

Process of Treating Ores. No. 1,197,589. This invention is by Raymond F. Bacon, of Pittsburgh, Pa., Assignor by Mesne Assignments, to Metals Recovery Company, a Corporation of Maine.

This invention relates to the treatment of non-sulphide ores, and ores containing non-sulphide metal constituents, in order to make the same amenable to flotation methods of concentration, and to the subsequent concentration thereof by flotation. This invention involves the conversion of such non-sulphide ores into sulphides, and the production of colloidal sulphur therein by treatment of the ores, either simultaneously or successively with sulphur dioxide and hydrogen sulphide whereby the ores are subjected to the action of hydrogen sulphide in the presence of sulphur dioxide and the sulphidation of the ore and the formation of colloidal sulphur effected by a single operation.

Excavating Machine. No. 1,196,957. This invention is by Charles B. King, Charles S. Johnson and Benjamin Jacoby of Marion, Ohio, Assignors to the Marion Steam Shovel Company of Marion, Ohio.

This invention relates to excavating machines and more particularly to an excavating machine of the steam shovel type utilizing an internal combustion engine as its source of power. The object of the invention is to provide an excavating machine in which a single gas engine will be utilized to drive the various parts of the mechanism and the power will be so distributed and controlled as to enable these various parts to be operated and controlled in substantially the same manner in which they are operated and controlled by the individual steam engines.

Apparatus for Separating Coal, Ore, etc. No. 1,197,946. This invention is by Frank Pardee of Hazleton, Pa.

This invention relates to an apparatus for separating solid substances of different specific gravity and weight and is of the hydraulic or jig type constituting one means by which the separating operation set forth and claimed in application filed May 2, 1913, Serial No. 765,170, may be carried into effect in separating some of the commercial sizes of coal from bone or slate, or in separating various kinds of ore from rock and other foreign substances or impurities.

Rock Drill. No. 1,196,011. This invention is by Niels C. Mickelson, of Denver, Colo., Assignor to the Denver Rock Drill Manufacturing Company of Denver, Colo.

This invention relates to a means for controlling the supply of cleansing fluid to a drill hole made by the drilling mechanism and the object is to provide novel, simple and practicable means by which the normal supply of cleansing fluid can be greatly augmented as is very desirable under certain conditions of work.

ELECTRICAL TRADE CONSUMES GREAT BULK OF MICA

The chief physical properties that give value to mica are its cleavage, flexibility, elasticity, transparency, lack of color in thin sheets, nonconductivity, of heat and electricity, and resistance to decomposition. These properties make mica indispensable in the electrical trade, which consumes most of it. Only one producer reported a greater output of stove mica than of electrical mica. The output of electrical mica of the other producers shows percentages ranging from 76 to 100 of their total output of cut sheet mica. Cut stove mica brings a much higher price—from $1.50 to $3.33 a pound: the corresponding price for cut electrical mica is 9 cents to 71 cents a pound. Mica is sometimes called isinglass when it is used in glazing, but true isinglass, although resembling mica in some of its properties, is a gelatinous substance made of the air bladders of certain fish, is soluble in boiling water, and burns readily, whereas mica is not combustible.

These facts are pointed out by W. T. Schaller of the Geological Survey. He says further:

The brilliancy of small scales of mica has made them valuable in the decorative arts, and hence ground mica is used extensively for the decoration of wall paper, to which it adds luster and brightness.

The crystals of mica are rough blocks, hexagonal if complete, or the mineral may occur in sheets of no regular shape, though perhaps one or two of the six sides of the crystal may be seen. The black, brown or red inclusions of iron oxide—the "specks"—are in some crystals arrayed in straight lines, which are either parallel to or bisect the edges of the crystal.

The rough blocks or crystals of mica, as mined, must be freed from adhering rock and split into thin sheets, which are rough trimmed with a knife, and the mica is then graded for size and quality. The rough blocks, as obtained from the mines, yield only about 10 per cent of finished trimmed sheet mica ready for use in the electrical and glazing trades. The remainder is scrap mica, suitable only for grinding. A few crystals have been reported to yield as high as 80 per cent of trimmed sheets, but this yield is unusually large.

The average yield of cut sheet mica, ready for the trade, from run-of-mine mica, as deduced from the reports of the producers, is 17 per cent for New Hampshire, 10 per cent for South Dakota, and about 9 per cent for Virginia and for North Carolina. The average yield for the United States, as calculated from the reports of 15 producers, is about 11 per cent, the limits being 2 and 33 per cent, respectively; the average for the United States, as calculated from the total production, is 7 per cent. The Arizona State Bureau of Mines has published a bulletin on mica in which is given a "flow sheet" from a New Hampshire mica mine, showing the quantities and values of mica in each 1,000 pounds mined used for different purposes. The yield of sheet mica, about 30 per cent, is much higher than the average for any single State.

The thin sheets of mica used in the trade are colorless. Muscovite in thin sheets is called clear or white mica; in sheets sufficiently thick to show a decided color, usually more than one-sixteenth of an inch, it is amber, yellow, green, brownish red or "rum," red or "ruby," smoky, gray, or brown. Phlogopite in thin sheets is generally yellowish or brownish; in thicker sheets it is yellow, brown, black, or coppery. Biotite is black and dark brown or green in thin sheets. "Specked" mica contains inclusions of dark minerals, mostly some form of iron oxide.

FIND HICKORY NUTS OLDER THAN THE PYRAMIDS

Among the fossils recently discovered by the United States Geological Survey, Department of the Interior, are remarkably well preserved impressions or casts of leaves of several extinct varieties of ash, oak, beech, and hickory, which were found along with three present-day species in States bordering the Gulf of Mexico. Although the leaves themselves have rotted and gone, here and there some were buried in soft clay by sediment in such a way as to leave perfectly preserved casts. The nuts, on the other hand, neither decayed nor petrified, but fell into pools of stagnant water, which is one of the best preservatives in nature, and sooner or later were also buried under silt and clay. Owing to their hard coats, those which fell into places favorable to their preservation are today in excellent condition, though slightly flattened by the long soaking and the gentle pressure of the clay. The deposit in which the leaves and nuts are found is not less than a million years old, or at least a hundred times as old as the pyramids of Egypt.

The report containing descriptions and reproductions of photographs of these fossil remains (Professional Paper 98-L) is purely technical, and may be obtained from the Director, Geological Survey, Washington, D.C.

FIELD ASSIGNMENTS IN MINING STATES ARE ANNOUNCED

Field assignments just have been made by the U. S. Geological Survey, in the principal mining states as follows:

ALABAMA

Study of red iron ores, E. F. Burchard.

Graphite deposits of Clay County, E. S. Bastin.

Texture and composition of marbles, T. N. Dale.

Description of coal field, Charles Butts.

Stratigraphy and paleontology of the upper Eocene and lower Oligocene formations, C. W. Cooke.

Structure studies of favorable localities for oil and gas accumulation, G. C. Matson, O. B. Hopkins.

Fossil foraminifera, J. A. Cushman.

Measurement of stream flow; W. E. Hall.

ALASKA

General geologic investigations, Alfred H. Brooks.

Investigation of water powers in cooperation with Forest Service, G. H. Canfield.

Geologic reconnaissance and investigation of mineral resources, Theodore Chapin.

Detailed topographic survey, D. C. Witherspoon.

Detailed geologic survey and study of mineral resources, A. C. Spencer, H. M. Eakin, F. H. Moffit.

Geologic reconnaissance surveys and investigation of mineral resources, J. W. Bagley.

Topographic reconnaissance surveys, B. L. Johnson.

Geologic reconnaissance surveys and study of mineral resources, G. C. Martin, R. M. Overbeck, A. G. Maddren.

Detailed geologic surveys and study of mineral resources, C. E. Giffin.

Topographic reconnaissance survey; geologic reconnaissance survey and investigation of mineral resources, S. R. Capps.

Investigation of ore deposits; investigation of placer deposits, J. B. Mertie, Jr.

Investigation of placer deposits, J. B. Mertie, Jr.

Geologic and topographic reconnaissance surveys and investigation of mineral resources, R. H. Sargent, G. L. Harrington.

Investigation of ore deposits, J. B. Mertie, Jr.

ARIZONA

Areal geology for folio, C. H. Clapp.

Areal geology for papers and folios, L. F. Noble.

Geology of copper deposits, F. L. Ransome.

Revision of folio map and text, C. F. Tolman, Jr.

Gypsum deposits, R. W. Stone.

Placer deposits near Congress, Weaver, Prescott, and Quartzite, J. M. Hill.

Topography, topography revision, to be assigned.

Measurement of stream flow, C. E. Ellsworth, M. D. Anderson, J. B. Spiegel.

CALIFORNIA

Areal geology, F. C. Calkins, F. E. Matthes.

Study of pegmatite dikes, W. T. Schaller.

Study of eruptive activity, J. S. Diller.

Preparation of folio text, F. L. Hess.

Graphite deposits, E. S. Bastin.

Detailed mapping of geology and ore deposits, J. F. Hunter, Jr.

Conclusions of field examination for folio publication, J. S. Diller.

Report on copper deposits of Shasta County, L. C. Graton.

Mineralogy of tourmaline deposits, W. T. Schaller.

General geology of southern California bordering Mexico, R. T. Hill.

Areal geology and oil pools, W. A. English, W. S. W. Kew.

Structure of productive oil fields, Lost Hills-McKittrick region, R. W. Pack, W. A. English.

Study of effect of water on oil, G. S. Rogers.

Completion of mapping and revision of text for folio, C. E. Weaver.

Topography and control, R. T. Evans, N. E. Ballmer, J. H. Le Feaver, R. Reeves, R. M. Wilson, L. F. Biggs, E. P. Davis, C. A. Ecklund, J. P. Harrison, C. P. McKinley, L. F. Biggs.

Measurement of stream flow, H. D. McGlashan, F. C. Ebert, Charles Leidl, C. J. Emerson, J. H. Morgan, H. M. Stafford.

Measurement of ground-water levels, W. O. Clark.

Supplementary ground-water survey, G. A. Waring.

Ground-water survey, W. O. Clark.

Study of physiographic effects of recent floods, O. E. Meinzer.

Survey of water in valley fill, C. H. Lee.

Measurements of ground-water levels, F. C. Ebert.

Ground-water reconnaissance, G. A. Waring.

COLORADO

General geology with special reference to igneous activity, Whitman Cross, E. S. Larsen, Jr., J. F. Hunter, Jr.

Glacial and postglacial deposits, W. W. Atwood, K. V. Mather.

Classification of coal land, C. E. Lesher.

Investigation of oil shale, D. E. Winchester.

Metallorgraphic study of ores, F. B. Laney.

Enrichment of silver ores, E. S. Bastin, Chase Palmer.

Description of Eocene flora, F. H. Knowlton.

Physiography of Rocky Mountain National Park, W. T. Lee.

Classification of coal land from Coal Basin to Crested Butte, E. R. Lloyd.

Examination of Tertiary and Cretaceous deposits on flanks of Rocky Mountains, W. T. Lee.

Paleontologic studies of Paleozoic sections, Edwin Kirk.

Popular guidebook to Mesa Verde National Park, M. R. Campbell.

Completion of monograph on geology and ore deposits, G. F. Loughlin.

Topography and control, Basil Duke.

Topography, C. L. Nelson, Basil Duke.

Measurement of stream flow, Robert Follansbee, W. R. King, H. K. Smith, P. V. Hodges.

IDAHO

Preparation of folio text, L. G. Westgate.

Classification of phosphate lands, G. R. Mansfield, P. V. Roundy.

Study of geology and ore deposits of the Coeur d'Alene district, J. B. Umpleby, E. L. Jones, Jr.

History of mining developments, W. P. Jenney.

Reconnaissance of ore deposits of Pine Creek, Deadwood, and Fort Hall districts, J. B. Umpleby, E. L. Jones, Jr.

Topography, C. G. Anderson, Albert Pike, E. M. Bandli, H. E. Burney.

Control, T. M. Bannon.

Measurement of stream flow, G. C. Baldwin, A. W. Harrington, L. W. Roush.

MONTANA

Summary report on coal fields, M. R. Campbell and others.

Yellowstone Valley above Billings for structures favorable for occurrence of oil, E. T. Hancock, W. T. Thom, Jr., J. D. Sears.

Musselshell Valley above Round-up for structures favorable for occurrence of oil, C. F. Bowen, W. P. Woodring.

Classification and mapping of metalliferous deposits and phosphate lands in Philipsburg-Melrose area, J. T. Pardee

Classification and mapping of phosphate lands between Helena and Yellowstone Park, D. D. Condit, E. H. Finch.

Classification and mapping of small areas of phosphate lands and metalliferous deposits, A. R. Schultz

Investigation of oil-bearing formations in Tejon County, Eugene Stebinger, M. I. Goldman.

Glacial deposits, W. C. Alden

Reconnaissance mapping for land classification, A. J. Collier, H. R. Bennett.

Classification of coal lands, A. J. Collier.

Geology and classification of lands in Crow Indian Reservation, C. H. Wegemann, R. W. Howell, C. K. Wentworth

Topography and control, K. W. Trimble

Topography, R. C. Seitz, J. E. Blackburn, F. C. Seitz, L. W. Muller.

Control, G. T. Hawkins

Measurement of stream flow, W. A. Lamb, A. H. Tuttle.

Ground-water survey, A. J. Ellis

NEVADA

Potash and nitrate prospects, H. S. Gale.

Examination of sediments from drill samples, M. I. Goldman.

Detailed mapping and study of gold deposits, H. G. Ferguson.

Report on occurrence of tin near Elko, Adolph Knopf.

Topography, H. H. Hodgeson, T. P. Pendleton.

Measurement of stream flow, C. C. Jacob, A. B. Purton, L. W. Jordan, J. J. Sanford, W. E. Dickinson.

Ground-water levels and percolation, W. O. Clark.

Ground-water survey, G. A. Waring.

NEW MEXICO

Summary description of coal fields, M. R. Campbell, W. T. Lee, and others.

Special geologic studies, Kirk Bryan

Gold placer deposits near San Pedro, J. M. Hill.

Detailed examination of Mongollon gold district and reconnaissance of Steeple Rock metal mining district, H. G. Ferguson.

Classification of coal lands, M. R. Campbell

Report on copper deposits, A. C. Spencer.

Reconnaissance survey of coal field, J. B. Reeside, Jr., F. R. Clark.

Reconnaissance of "Red Beds" saline deposits, N. H. Darton.

Study of zinc deposits, G. F. Loughlin.

Topography revision, O. G. Taylor

Tpoography and control, to be assigned

Topography, C. C. Gardner

Preliminary study of artesian basin and experiments in measuring flow in artesian wells, O. E. Meinzer.

Measurement of stream flow, Robert Follansbee, W. R. King.

PENNSYLVANIA

Examination of feldspar deposits, F. J. Katz

Summary description of anthracite region, Baird Halberstadt.

Summary description of bituminous coal fields, G. H. Ashley.

Detailed mapping, G. B. Richardson, R. V. A. Mills.

Completion of folios, G. H. Ashley

Folio description, G. H. Ashley.

Topographic revision, J. I. Gayetty

Studies of valley formations, G. W. Stose.

Detailed mapping, E. F. Bliss.

Completion of folio, Charles Butts.

Detailed mapping and completion of folio, H. B. Kümmell

Topography, D. Hannegan

UTAH

Geology and ore deposits of State, B. S. Butler, G. F. Loughlin.

Examination of gypsum deposits, R. W. Stone.

Summary reports on coal fields, M. R. Campbell and others.

Measurement and field tests of oil shales, D. E. Winchester, W. B. Wilson.

Geology and ore deposits of Cottonwood and American Creek districts, B. S. Butler, F. F. Hintze.

Paleontology of early Paleozoic formation, Edwin Kirk.

Classification of coal lands, E. R. Lloyd.

Completion of folio, F. R. Clark.

Topography, G. Young.

Classification of land in regard to domestic water supplies, G. A. Waring.

Measurement of stream flow, C. C. Jacob, A. B. Purton, L. W. Jordan, J. J. Sanford, W. E. Dickinson.

CHIEF ENGINEER RICE ON IMPORTANT INSPECTION TRIP

An important trip of inspection and investigation is being made by George S. Rice, chief mining engineer of the Bureau of Mines. Mr. Rice left Washington the middle of September. He visited the Cleveland tunnel and spent several days in consultation with city officials at Milwaukee with regard to the problem arising from driving a tunnel under the lake at that point. He is now in the iron district of Minnesota.

Early this month Mr. Rice will arive in Butte, where he will familiarize himself, from first-hand knowledge, on the work being carried on by Daniel Harrington and Dr. Anthony J. Lanza. In addition to the study which they are conducting as to the causes of tuberculosis among miners, they are investigating the effect of temperature and humidity on the effective working power of men in mines.

While in Butte Mr. Rice intends to pay particular personal attention to the problem of ventilation in deep and remote workings. This problem is particularly acute just now in Butte mines, especially in workings adjacent to old fire areas.

From Butte Mr. Rice expects to go directly to Seattle, where he will look into the problem which has arisen in gold mines in that district. Numerous mines are being troubled by so-called "bumps." These phenomena are supposed to be due to the pressure of rocks.

At San Francisco Mr. Rice will acquaint himself with the progress of the cooperative work between the Bureau of Mines and the Industrial Accident Commission of California. He will also consult with Edward Higgins, who has been in charge of the Bureau of Mines' work in California. One of the questions which will be considered at San Francisco is the matter of a successor to Mr. Higgins, who has resigned. Since the position comes under the civil service only persons who have taken special examinations for this place can be considered for it. Several western metal mining engineers have been certified by the civil service commission as possibly qualifying for the place and Mr. Rice will confer with them personally.

Mr. Rice expects to reach San Francisco the latter part of October and will return to Washington the middle of November.

MINERALS SWELL TONNAGE PASSING THROUGH CANAL

Minerals continue to form a considerable proportion of the tonnage passing through the Panama Canal. Antimony is moving from Yokohama to New York and from Antofagasta to Liverpool. Borax is moving from Liverpool to northern Pacific ports, from New York to New Zealand and Australia, from Antofagasta to Liverpool and to Havre.

Coal is moving from Norfolk and Baltimore to Antofagasta, Guayaquil, Iquique, Punta Arenas and Callao. The United Kingdom seems to be furnishing most of the coal for Chilian ports.

Other minerals are moving as follows:

Copper and copper ores, Callao to New York; Antofagasta to New York; South Pacific Islands to Liverpool, Yokohama, New York, Lota, Liverpool, Kobe, to New York. Acajutla to New York, Chilian ports to New York and Liverpool.

Coke from Norfolk to Punta Arenas, Glasgow to Santa Rosalia.

Iron and iron ores, United Kingdom to Chile, Copenhagen to Shanghai, Norfolk to Punta Arenas, Chilian ports to Philadelphia.

Nitrates from Chilian and Peruvian ports to San Francisco, Rotterdam to Liverpool, Hampton Roads to New York, Philadelphia, Norfolk, Glasgow, Baltimore, New Orleans and Pensacola.

Crude iron from San Francisco to Ecuadorian and Peruvian points.

Gold and silver (small shipments) from Pacific ports of Central America and from Callao to New York and Liverpool.

STATE SURVEYS PREPARE TO EXAMINE OIL SHALES

Four states are expected soon to undertake, through their Geological Surveys, an important examination of oil shales. The important work which has been done by the Geological Survey and Bureau of Mines in the examination of these hydrocarbon shales is attracting wide attention. By distilling these shales on the ground it has been possible to gather much additional information with regard to their value as sources of oil and gas.

Owing to the increasing possibility that these oil shales may be exploited commercially in the near future the State Surveys in question are preparing for extended examinations, it is understood.

MICA DEPOSITS OF IMPORTANCE OCCUR IN MANY STATES

Mica is widespread in its occurrence and is one of the commonest minerals, says Waldemar T. Schaller, of the U. S. Geological Survey. It is found in many igneous rocks, in a large proportion of metamorphic rocks—as, for example, mica schist—and in many secondary rocks such as sandstone and shale. The natural processes of change which turn the feldspars of rocks into clay have but little effect on mica, which finds its way into the resulting sands and clays that are later consolidated into the sedimentary rocks—sandstones and shales. These bright, shining specks or scales of mica are often mistaken for gold or other valuable mineral, particularly if the original mica was biotite instead of muscovite, for much of the iron-bearing biotite assumes a golden-yellow or brownish color in its weathered forms.

The mica scales in the sandstones and shales are too small and too scarce to be of any commercial value. Many of the metamorphic rocks, such as the schists and gneisses, contain more mica than sandstone or shale, but the small size of the mica scales and the presence in abundance of quartz and other minerals has so far rendered such occurrences of doubtful value. Some mica schists or sericite schists (fine, shreddy muscovite is called sericite) that consist almost entirely of mica, with practically no quartz or other harder mineral, may be valuable. Quartz is so commonly associated with mica in metamorphic rocks that it seems doubtful whether any large bodies of sericite schist can be found that would be workable at a profit if mica should be the only product obtained. Sericite, as is noted by Rogers, may be a low temperature modification of muscovite; it may be a dimorphous form and therefore a distinct species.

A small quantity of fresh pegmatite rock containing mica in scales larger than those of the metamorphic schists but still too small to be used otherwise than as scrap for grinding has been crushed and the mica extracted from it. Mica has also been concentrated from the residue of a clay plant that worked an altered pegmatite rock for its clay content, which was a product of decomposition of feldspar.

Mica forms about 4 per cent of all igneous rocks, but sheet muscovite can be extracted commercially only from pegmatite. Pegmatite is a rock similar to granite in chemical and mineral composition, but has a more variable and coarser texture. It occurs in irregular-shaped masses, streaks, lenses, or sheets called veins or dikes, which vary many feet in both length and thickness. The surrounding rock is generally geologically very old, much of it changed to a gneiss or schist, the directions of whose structural features have had a large influence on the direction of the pegmatite sheet. In some mines the muscovite is concentrated in one or more well-defined layers or bands near the edges of the pegmatite but more commonly it is scattered unevenly through the pegmatite, or the mica crystals may occur as individuals or in clusters scattered irregularly through the rock.

The occurrence of mica in sheets several feet in width makes it particularly valuable. Individual crystals 2 feet wide are not rare, and crystals 1 foot wide are common. A crystal from New Hampshire was 28 inches wide and 4 feet 2 inches long; another fine crystal was 2 feet wide and 2 feet long. Two crystals from North Carolina measured, respectively, 33 by by 32½ inches and 33½ by 29½ by 17½ inches. Muscovite crystals 10 feet across the cleavage plane are reported to have been found in the Nellore district, India. Phlogopit has been reported from the Canadian mines in crystals 5 feet wide and nearly 10 feet long, weighing about a ton and a half. Mr. M. F. Westover, of the General Electric Co., states that one crystal measured 119 inches in width. It is of interest to record the gift of a section of a crystal of phlogopite from a mine near Sydenham, Ontario, Canada, to the United States National Museum, where the specimen is on public exhibition. The gift was made by Mr. Westover, through the United States Geological Survey. The section, which is somewhat less than an inch thick, measures 47 by 35 inches across the cleavage face. Crystals so large are very exceptional, few exceed 2 feet across the cleavage faces.

The United States, Canada, and India are large producers of mica, and it is also obtained from German East Africa, Brazil, South Africa, Ceylon, Norway, China, Japan, Argentina, and South Australia. Deposits that may be of value have been reported from several other countries.

Mica deposits of probable value have been found in about half the States of the United States. The principal producing States have been North Carolina, New Hampshire, South Dakota, Idaho, New Mexico, Colorado, Virginia, South Carolina, Alabama, and Georgia.

TREASURY DEPARTMENT MODIFIES RULE FOR APPRAISEMENT OF ZINC

Appraisement of zinc at customs houses has been ordered modified. The Treasury Department has issued this statement in that connection:

"The plan for the appraisement of zinc in ore published in T. D. 36446, is hereby modified to provide that the method therein set forth shall not apply to sulphide ores assaying 40 per cent or less of zinc. The zinc in such ores should be appraised at not less than the contract or purchase price."

NAVY'S GREAT NEED OF OIL JUSTIFIES NATION IN HOLDING RESERVES, ENGINEERS SAY

Seventy New War Vessels Will Burn Oil—New Battle Cruisers Will Develop 180,000 Horsepower Each—New Ships Alone Will Require 116,000 Barrels Daily if Run at Full Speed.

The conservation of the naval oil reserves, which is ardently advocated by Secretary Daniels, is easily understood to be necessary, in the opinion of the engineers of the navy and coast-guard service, when the huge building program of oil-burning vessels for the government is held in mind. The vast amount of oil that will be required to operate the vessels already authorized makes it necessary for the government to own and control its own oil fields, they say.

Hereafter all of the naval vessels, the coast-guard vessels and such ships as may be constructed for the use of the army are to be oil burners. In the naval appropriation law for the fiscal year provision is made for the construction of seventy vessels immediately, all of which will burn oil.

For the first time in the history of the navy, battle cruisers have been authorized with such tremendous horsepower. Each of these warships is to have 180,000 horsepower. The greatest provided in any vessel in the United States Navy at present is 32,000.

Four of these battle cruisers are to be begun immediately, with a total horsepower of 720,000; four battleships are authorized with a total horsepower of 140,000; four scout cruisers with a horsepower of 240,000; twenty torpedo boat destroyers with a total estimated horsepower of 240,000; twenty-eight submarines with a total estimated horsepower of 28.000; three fuel ships with a total estimated horsepower of 29,000; one repair ship with an estimated horsepower of 8,000; one transport ship with an estimated horsepower of 8,000; one hospital ship with an estimated horsepower of 8,000; two munition ships with an estimated horsepower of 16,000; two gunboats with an estimated horsepower of 4,000. The total horsepower estimated for these vessels is 1,436,000, or in round numbers 1,500,000.

ESTIMATED OIL CONSUMPTION

One pound of oil will create one horsepower an hour, according to the estimates of the engineer officer. They figure that these seventy vessels just authorized for the navy, if run at speed, in a day will consume 36,000,000 pounds of oil. Estimating 310 pounds to a barrel, these vessels will consume 116,000 barrels of oil a day. Roughly estimating the price of oil at $1.50 a barrel, to drive these vessels at speed for one day it will cost the government $174,000.

In the case of the battle cruisers, with their 180,000 horsepower each, running at full speed, such a cruiser will consume 4,320,000 pounds of oil, or 14,000 barrels, in a day. Each of these new battle cruisers when completed must be a veritable oil well. It is planned to have a sufficient supply aboard for a twelve-day cruise at full speed, or about 150,000 barrels. These vessels, with such a supply of fuel can easily cross the Atlantic and return and still have fuel left.

The coast guard service this year was authorized by Congress to build eight new vessels, all of which will burn oil or gasoline. While the use of fuel oil by the coast guard service cannot compare in volume to its use by the Navy, still it will be appreciable.

ANNOUNCES TOTAL FOR 1917

The Bureau of Supplies and Accounts of the Navy Department has completed estimates of the fuel oil consumption of the United States Navy for 1917, and announced a total of 50,000,000 gallons. It is expected that the demands of the Government for fuel oil for its vessels will increase as the years go on. It is estimated that the United States controls 60 per cent of the total supply of the world. If Mexico were included in this estimate it would bring it up to about 75 per cent of the total supply. The geological survey has figured that there is at present in sight in the United States a sufficient supply of oil to meet all the demands for the next sixty years, allowing for an increase in the use of oil and gasoline each year.

The use of oil as fuel for vessels is bringing about a great saving of the Government's money, it is stated, and also makes it possible to increase the speed of the vessels. In the first place oil costs less than coal for the power derived. In the second place, it enables the vessels to operate with smaller crews. In the third place, it brings about a great saving in the amount of paint used, for the coaling of naval vessels frequently makes new painting necessary.

VESSELS COMMITTED TO USE OF OIL

In constructing these oil burners, the Navy and the coast guard service are committing the vessels to the use of that fuel during their life. For while it has been possible to convert coal-burning vessels into oil burners, it is said that it would be absolutely impossible to convert an oil burner into a coal burner.

It is planned to store part of the fuel oil in these new vessels in the five or six "skins" which will run in parallel layers below the water line, and which are designed to protect the new vessels from torpedoes launched by submarines. The naval engineers believe that these "skins," which are in reality separate bottoms, will effectively protect a vessel from a torpedo.

Pending before Congress is the Phelan oil-land-leasing bill, which the conservationists insist will deplete the naval oil reserves if enacted into law. It is expected that a hard struggle over this measure will develop in the Senate when that body meets in December. The Democratic caucus of the Senate has agreed that the measure shall be taken up then.

CAMELS ONCE RAN WILD IN STATE OF MISSISSIPPI

The geology of mountain regions is generally more difficult to master than that of plains because the rocks have been more broken and tilted about, but the geology of certain parts of Mississippi is almost as difficult as that of a mountainous region because certain widely distributed formations bear few definite identification marks, particularly remains and impressions of plants and animals that lived at the time they were formed. A peculiar southern sandstone, which geologists have called the Catahoula sandstone, has been studied with care by G. C. Matson and E. W. Berry, of the United States Geological Survey, Department of the Interior, who have been able to identify and follow the stratum by means of the remains of plants. Among the plants found were pines, ferns, leaves of date palms, tropical myrtles, figs, and a tree closely related to the present-day Mexican and Central American sapota, from which most of the material for chewing gum is obtained. These fossil plants show that at the time the sandstone was formed—perhaps ten million years ago—the climate of this region was tropical, and bones of camels found by other geologists and the similarity of the sand composing the sandstone to certain tropical desert sands have a similar implication. The report describing these fossil remains (Professional Paper 98 M) is purely technical. A copy may be obtained from the Director of the Geological Survey, Washington, D. C.

IMPROVEMENT NOTED IN MID-CONTINENTAL FIELD

(Special correspondence.)

Tulsa, Okla., September 25.—The oil conditions in the mid-continent field are improvinging. The pipe lines are running more production than last month and it is rumored that all of the production on the connections to the pipe line in the mid-continent fields will soon be run to full capacity and that the oil market will soon react and that the price will begin to climb upward once more. The oil producers look for a $2 a barrel price for their crude by early summer of next year.

Drilling has become more active and some good wells have recently been reported in the Augusta pool in Kansas.

Many locations are being made in Oklahoma and Texas. Leases are becoming active once more and their values are beginning to increase. Some good sales for production of properties have recently been reported, among which is the Clabrowl, about six miles northeast of Tulsa, which was sold to eastern parties for $175,000 cash. This property embraces about 700 acres and about seven wells in that red fork sands about 1,200 feet deep. The daily production is about 250 barrels a day and new production, as a majority of these wells were drilled in June, July and August.

In the Headlton, near Ardmore, Okla., several good properties have changed hands on a basis of $400 to $500 per barrel settled production, thirty days' pipe line runs.

A good many small refineries are being begun in this section, especially skimming plants and casing-head gas plants; among the last constructions is the new plant of the T. H. Gasoline Company, at Chelsea, Okla.

The Walker interests are also beginning a casing-head plant at Chelsea.

The White Oil Company recently drilled in a well in the Chelsea field, which shows 22 feet of oil-bearing sands. This well was considered a wild cat and opened up a new district in the Chelsea field and extended the field about two miles north and east. The White Company also recently drilled in a good well in the Sageeyah field, five miles north of Claremore, which shows 45 feet of oil-bearing sand, depth, 1,000 feet, and considered one of the best wells in this field.

The Starky Oil & Gas Company recently drilled in a good gasser at Chelsea, which, in conjunction with the White Oil Company, also extended the Chelsea field.

The Albemarle Producing Company has just spudded in its well to drill on a 900-acre block 6 miles south of Chelsea, and as this is a wild cat, this well is being watched with much interest, and if same comes in a producer it will open up an entirely new field in the Chelsea district.

The larger companies are reporting some good producers in their different fields in this section.

Latest Legal Decisions

RIGHT TO ENFORCE

The owner of an undivided seven-eighths interest in an oil and gas lease entered into a contract with the owner of the one-eighth interest by the terms of which such owner of the seven-eighths interest was to furnish all derricks, casings, tanks, tubing and all other machinery and supplies, and to furnish all labor and pay all expenses incident to completing operating wells for oil and gas on the leased premises; and the owner of the one-eighth interest agreed to pay one-eighth of all amounts expended under the contract. Pursuant to the contract the owner of the seven-eighths interest did furnish derricks, casing and other material and oil-well supplies used upon the leased premises for the purpose of developing and operating the lease and made payment for labor, in all, to the amount of more than $2.000. Under these facts the owner of the seven-eighths interest cannot enforce a lien upon the one-eighth interest of his co-tenant under the revised laws of Oklahoma (Sec. 3865), which provide that any person who shall under contract with the owner of any leasehold for oil and gas purposes, perform labor or furnish material, shall have a lien therefor, for the reason that the contract made between the co-tenants was for the purpose of the development of their common property, and was not a contract with the owner of an oil or gas lease for the drilling of wells or the furnishing of the materials therefor as contemplated by the statute. The work done and materials furnished were for the improvement of the common property, and while under the contract between the co-tenants and the co-tenant performing the work and furnishing the materials is entitled to contribution from his co-tenant in proportion to his interest to reimburse him for monies expended in making such improvements, but he is not entitled to enforce a mechanic's lien therefor upon the undivided one-eighth interest of his co-tenant.

Uncle Sam Oil Co. *vs.* Richards (Oklahoma), 158 Pacific, 1187, p. 1189.

OPTION OF LESSEE

Where an oil and gas lease does not fix the number of wells to be drilled for the development of the premises as contemplated, the lessee then has the right to determine the number of wells or the extent of the development and his decision is conclusive on this subject so long as he acts honestly and in good faith upon sound business principles.

Gilbert *vs.* Boles (Indiana App.), 113 Northeastern, 379, p. 380.

PROSPECT HOLE LIABILITY

The value of a prospect hole for oil, caused to be drilled by a lessee of oil and gas lands, but not completed, is not dependent upon the fact that it may be dry or may be a productive well and its value in case of its destruction by want of ordinary care upon the part of a person in charge of some duty to the owner in relation thereto is ordinarily measured by the amount necessary to bring it to the point where such destruction occurred. A person guilty of negligence, or even of wrongdoing resulting in the destruction of a prospect hole cannot be charged with the entire cost of completing such hole if it had been abandoned as worthless, but where the prospective value has not been and cannot be determined the situation is different. The lessee or owner has a right to expend his money in drilling such a prospect hole or well to the depth which he desires without the neglect or wilful interference of a third party and the fact that the venture may ultimately become a loss to him is no defense to an action against persons charged with the neglect or willful destruction of such a prospect hole. The value of such a prospect hole, the value of which as an oil and gas well is not determined, is the amount necessary to bring such hole or well to the point where its completion was wrongfully prevented and the damages would necessarily be the expenditures incurred under the contract for the drilling of the same, plus the amount necessary to complete the hole according to the terms of the contract, above the amount agreed to be paid the contractor for any further drilling, less any amount due the drilling contractor for the work done under the contractor; but if the hole or well is destroyed either by the negligence or the want of ordinary care on behalf of the driller, and the drilling of a new hole becomes necessary in order to complete the contract, then the cost of drilling such new hole is an element of the amount necessary to complete the hole according to the terms of the contract for further drilling, as any such further drilling cannot be done without a hole of the original depth with which to start.

North Healdton Oil and Gas Co. *vs.* Skelly (Okla), 158 Pacific, 1180, p. 1182.

NEGLIGENCE OF FELLOW SERVANT

Where a mine operator fails to furnish his employes and miners a safe place, machinery, tools or appliances, and as a result of such failure a miner is injured, the fact that the negligence of a fellow servant commingled with such failure on the part of the operator will not exonerate the operator from liability.

Bartlesville Zinc Co. *vs.* Prince (Oklahoma), 158 Pacific, 622, p. 628; June, 1916.

SALT LAKE VALLEY SMELTERS TO BE ENLARGED MATERIALLY

Salt Lake City, Sept. 23.—Relief of lead, silver, and copper producers of Utah who have been suffering for the last three months on account of congestion of the Salt Lake valley smelters, is promised in a statement made public September 1 by C. W. Whitley, general manager of the American Smelting and Refining Company. Mr. Whitley said that within six months the capacity of the company's Garfield smelter would be doubled, giving it a capacity of 800 tons of copper every 24 hours. He also says that within the same period the Murray plant of the company would be so enlarged as to enable it to handle all the lead ores offered. The furnaces will be enlarged and improved and a new stack 450 feet high will be built. Plans for the improvements are completed and some of the material is already on the ground.

The two plants employ about 3,000 men and this force will necessarily be increased to handle the new construction and the increased volume of business that will follow it.

BUREAU OF MINES PLANS IMPORTANT OIL WORK

During the current fiscal year some very important work will be done by the Bureau of Mines in its petroleum division. This work has been divided under the following heads:

Special investigation of oil shales.

Analysis and tests of fuel oil belonging to the United States.

The study of the most efficient drilling methods with a view to reducing underground waste.

The study of the most efficient method of storing and transporting petroleum.

The extraction of gasoline from gas, and the refining problems from an engineer's standpoint with a view to reducing waste and loss incident thereto to a minimum.

The study of the most efficient methods of utilizing petroleum and its products and the chemical problems relating to refining and treatment.

OVER 20,000,000 ACRES OF COAL LANDS HAVE BEEN RESTORED

A summary of principal withdrawals and restorations during the period March 4, 1913, to August 31, 1916, is as follows (in acres):

	Outstanding Withdrawn Mar. 4, 1913	*Withdrawn During Period*	*Restored During Period*	*Outstanding Withdrawn Aug. 31, 1916*
Coal	[illegible]	[illegible]	20,600,041	[illegible]
Oil and gas	4,817,706	1,486,011	[illegible]	[illegible]
Phosphate	[illegible]	449,081	[illegible]	[illegible]
Potash	[illegible]	311,264	[illegible]	[illegible]
Power site	[illegible]	[illegible]	[illegible]	[illegible]
Public water	[illegible]	[illegible]	2,707	[illegible]
Total	73,672,881	3,671,044	[illegible]	[illegible]

BURCHARD TO VISIT IRON, LEAD AND ZINC DEPOSITS

E. F. Burchard of the Geological Survey will leave early this month to start field work, which will be under the immediate charge of T. Nelson Dale, in the marble deposits of eastern Alabama and northwestern Georgia. While in Alabama, Mr. Burchard will visit certain iron ore deposits, including the gray iron ores of Talladega County. These ores will be sampled with reference to their potash content. About the middle of October Mr. Burchard plans to go to northwestern Arkansas to make a field investigation of the recent development of zinc and lead in that region.

The results of the investigation in Arkansas will be supplemental to a report on this district written by Adams and Burchard as professional paper No. 24 in 1904.

LARSEN STUDIES GEOLOGIC HISTORY IN COLORADO

After a detailed reconnaissance of certain volcanic rocks of Colorado, E. S. Larsen, Jr., has returned to Washington to make his report. Mr. Larsen states that some mining activity is in evidence in the section where he has been devoting his principal time to the study of geological history. Some ore is being shipped from the Beidel region, where considerable prospecting is being done on gold and silver-bearing veins. There is also some prospecting being done on manganese deposits. At Summer Coon there is a deposit of iron ore which is attracting some attention from prospectors.

During his investigation this summer Mr. Larsen found considerable quantities of the rare mineral gearksutite and of the new mineral creedite. This latter mineral was discovered by Mr. Larsen.

NICKEL NEARLY ALWAYS FOUND WITH DARK IGNEOUS ROCKS

Nickel is seldom found except in association with the dark igneous rocks, that is, with those rocks which have been melted and which contain comparatively little quartz. It is found with serpentines, peridotite (a rock made up largely of olivine). The great deposit at Sudbury, Ontario, is in a granular rock called norite. At Sudbury the norite contains great quantities of the iron sulphide known as pyrrhotite. This is the iron sulphide which is attracted by a magnet. The ordinary iron sulphide, pyrite, is not. At Sudbury the ore is also accompanied by a considerable quantity of copper minerals.

New Law Serial Out

The Bureau of Mines has just issued its eighth law serial on "Abstracts of Current Decisions on Mines and Mining." Copies of these may be had on request to the Bureau

PERSONALS

John A. Rice, who is operating the Curry Mines at Silver Center, Ontario, was a recent Washington visitor. He has gone to Utah, where he will spend a month looking over mining properties. Afterwards he will visit other states in the Southwest.

Kirby Thomas, a mining engineer of New York City, paid a business visit to Washington last month.

A. R. Shepard, son of former Governor Shepard, of the District of Columbia, who is operating tungsten mines near Ragan, Nevada, is in Washington visiting relatives. Mr. Shepard formerly was manager of the Batopilas mines in Mexico, but owing to the interruption of railroad transportation these mines have been doing very little work for the past several years.

E. O. Ulrich, paleontologist with the U. S. Geological Survey, has returned from four months' field work in Illinois and New York.

Max W. Ball is acting as chief clerk of the Bureau of Mines during the absence of F. J. Bailey, who is taking military training at Plattsburg.

Carl H. Beal, a graduate of Stanford University, has joined the petroleum force of the Bureau of Mines. Mr. Beal has been doing technical work in Oklahoma for the past two years.

John Johnston, who has been connected with the Geophysical Laboratory of the Carnegie Institute, has resigned to accept a position on the technical staff of the American Lead and Zinc Smelting Co., of the Joplin district.

W. R. Weigle, of Philadelphia, who is operating a uranium mine near the Paradox Valley and other mines in Colorado, was in Washington recently on business connected with the Land Office.

H. D. McCaskey, chief of the mineral resource division of the Geological Survey, is on a trip of inspection and investigation on the Pacific coast. He will investigate several of the quicksilver deposits in that portion of the country.

Judge Joseph W. Thompson, the head of the legal division of the Bureau of Mines, has returned from a month's vacation spent at Mountain Lake Park, Maryland.

J. A. Davis, the mining engineer who will have charge of the new experiment station at Fairbanks, is enroute to Fairbanks, where he will conduct a preliminary survey looking to the establishment of the station.

Max W. Ball of the Bureau of Mines is visiting Colorado and Wyoming in the interest of certain phases of the Bureau's work.

E. W. Shaw, petroleum specialist of the Geological Survey, has returned from a business visit to the Tampico region of Mexico.

The topographical division of the Geological Survey has just completed the Bar Harbor and Mt. Deseret sheets which show the Sieur de Monts National Park. This is the only national park east of the Mississippi River.

D. Foster Hewett, of the U. S. Geological Survey, writes from Peru that he has completed an examination of the vanadium mines at Ragras.

Carl Scholz, president of the American Mining Congress, was host to a party of mining engineers during the recent meeting of the American Institute of Mining Engineers in the Southwest. The trip was made in Mr. Scholz's private car.

J. F. Callbreath left the latter part of September for Denver and Salt Lake, on special work connected with the coming convention of the Mining Congress in November.

F. G. Clapp and C. T. Griswold have recently been engaged in geological examinations in Texas.

G. R. Mansfield, a geologist of the United States Geological Survey, has completed the mapping of the Henry, Cranes Nest, and a part of the Portneuf quadrangles in Idaho.

Frank L. Hess, of the Geological Survey, has returned from South Hampton, N. H., where he was called by the death of his mother.

DENVER QUARTZ MILLS

AND DENVER STEEL CRUSHERS

have that kind of reliability that constantly and continuously keeps on being reliable.

The Denver Quartz Mill & Crusher Co.
216-17 Colorado Bldg., Denver, Colo., U.S.A.

THE MINING CONGRESS JOURNAL

LIBRARY
NOV 14 1916

NOVEMBER, 1916

VOL. II

No. 11

SAFETY—EFFICIENCY—CONSERVATION

DU PONT

EXPLOSIVES

FOR ORE MINING

ACTIVELY engaged for over a century in making explosives, the Du Pont Company believes ore mining engineers and miners will find Du Pont Explosives to be best adapted to all kinds of ore mining.

Continuity of production, prompt shipments and quick deliveries of Du Pont Explosives are assured owing to the operation of many mills situated in all sections of the country.

There is a Du Pont Explosive adapted to every ore mine.

Our corps of technical experts are at your service to recommend a Du Pont Explosive capable of increasing production, improving working conditions and reducing mining expense.

E. I. du Pont de Nemours & Co.
Powder Makers Since 1802
Wilmington, Delaware

PUBLISHED BY
THE AMERICAN MINING CONGRESS
PUBLICATION OFFICE
MUNSEY BUILDING WASHINGTON, D.C

$ 2 00 PER YEAR 20 ¢ PER COPY

Link-Belt Equipment

For Preparation and Handling Coal at the Mine

LINK-BELT machinery is standard among those who investigate and specify the best. Link-Belt Coal Handling equipment stands the test of low operating and maintenance charges, because the operation of many Link-Belt plants today (some of which we built twenty years ago) are as monuments to our careful design and rugged construction.

The success of the Link-Belt Company is indicated by the reorders we receive for new work undertaken by our customers, which include, we are proud to state, some of the largest and most successful coal companies in the country.

We design and build Coal Tipples, Coal Washeries, Retarding Conveyors, Rescreening Plants, Coal Pockets, Picking Tables, Car Dumps, Car Hauls, Box Car Loaders, Screens, Chutes, Coal Crushers, Belt Conveyors, Bucket Conveyors, Link-Belt and Sprocket Wheels, Silent Chain Drives, Transmission Machinery, Water Intake Screens.

Submit your problems to our experienced engineers for solution.

LINK-BELT COMPANY

PHILADELPHIA CHICAGO INDIANAPOLIS

New York . . 299 Broadway
Boston . . 49 Federal St.
Pittsburgh . 1501 Park Bldg.
St. Louis, Central Nat. Bank Bldg.
Buffalo . 608 Ellicott Square
Cleveland, 1304 Rockefeller Bldg.
Los Angeles, 161 N. Los Angeles St.
Denver . Lindrooth Shubart & Co., Boston Bldg.

San Francisco . N. D. Phelps, 461 Market St.
New Orleans . C. O. Hinz, Hibernia Bank Bldg.
Knoxville, Tenn., D. T. Blakey, Empire Bldg.
Toronto . Canadian Link-Belt Co., Ltd
Detroit . 732 Dime Bank Bldg.

Wilkes-Barre, Second National Bank Bldg.
Minneapolis, 418 South Third St.
Louisville, Ky . . F. Wehle, Starks Bldg.
Seattle . . 580 First Ave., S.
Portland, Ore., Fourteenth and Lovejoy Sts.

PROVISIONAL PROGRAM

SUBJECT TO REVISION

Nineteenth Annual Session

OF

The American Mining Congress

CHICAGO, ILLINOIS

November 13-16, 1916

OFFICIAL HEADQUARTERS AT THE LA SALLE HOTEL

GENERAL SESSIONS

Note—Those marked with (*) have not definitely decided to be present.

MONDAY, NOVEMBER 13, 2 P. M.

Convention called to order at 2 p. m. by Harry C. Adams, *Chairman, Committee of Arrangements.*

Invocation—Rev. Frank W. Gunsaulus, Chicago, Ill.

Address of Welcome—Hon. Edward F. Dunne, *Governor of Illinois.*

Address of Welcome—Hon. Wm. H. Thompson, *Mayor of Chicago.*

Address of Welcome—J. W. O'Leary, *President, Chicago Association of Commerce.*

Response to Addresses of Welcome—

Three-minute responses by representatives of the several States, each with resolution embracing State's most important mining issue.

TUESDAY, NOVEMBER 14, 10 A. M.

Carl Scholz, Presiding; C. S. Keith, Alternate Chairman.

Subject—"Safety in Mining Operations."

Introduction of Resolutions.

Address—"The Record of Mine Safety Work"—Albert H. Fay, *U. S. Bureau of Mines*

Address—"State Mine Rescue Methods"—Dr. H. H. Stoek, Urbana, Ill.

Address—"Safety Work as an Investment"—C. W. Goodale, Butte, Mont.

Address—"Responsibilities and the Duties of the Operator"—*Thomas M. Gann, Knoxville, Tenn.

Address—"Of the Miner"—David Ross, Springfield, Ill.

Address—"Of the Public"—*Judge W. D. Hoag, Joplin, Mo.

Open discussion under 10-minute rule.

Selection of Committee on Resolutions.

Recess.

TUESDAY, NOVEMBER 14, 8 P. M.

Annual members' meeting for the election of directors and the transaction of routine business.

GENERAL MEETINGS

MONDAY, NOVEMBER 13, 8 P. M.

SIDNEY NORMAN, Spokane, Wash., Presiding.

Illustrated Lecture—"Mining in the Arctic Regions of Alaska and Siberia"—DR. HENRY MACE PAYNE, New York City.

Illustrated Lecture (Moving)—"The Cerro Azul Gusher"—E. L. DOHENY, Los Angeles, Cal.

WEDNESDAY, NOVEMBER 15, 9 A. M.

HENNEN JENNINGS, Presiding; DR. JAS. E. TALMAGE, Alternate Chairman.

Subject—"Efficiency in Mining Operations."

10 a. m.—Introduction of Resolutions.

Report—Committee on Relations with Federal Trade Commission—CHARLES M. MODERWELL, *Chairman*, Chicago, Ill.

Address—"Federal Aid to Mining Efficiency"—VAN H. MANNING.

Address—"The Federal Trade Commission and the Mining Industry"—HON. E. N. HURLEY, Washington, D. C.

Address—"Industrial Cooperation Under the Sherman Law"—*GLEN W. TRAER, Chicago, Ill.

Address—"The Sherman Law and Its Relation to Mining"—To be selected.

Address—"Efficiency in Ore Treatment"—*E. P. MATHEWSON, Anaconda, Mont.

Discussion.

THURSDAY, NOVEMBER 16, 9 A. M.

WALTER DOUGLAS, Presiding; S. A. TAYLOR, Alternate Chairman.

Subject—"Conservation."

10 a. m.—Introduction of Resolutions.

Report—Committee on Forest Relations—CARNEY HARTLEY, Denver, Colo., *Chairman.*

Address—"Conservation: Its Purpose, Its Effect, and Who Should Pay for It"—To be selected.

Address—"Conservation in Mining Through Water Power Development"—CHARLES F. POTTER, Los Angeles, Cal.

Address—"Waste in the Mining Industry; In Mining; In Distribution and in Use; and the Relation of These Wastes to the Operator, the Consumer, and the Public"—To be selected.

Address—"The State Geologist and Conservation"—DR. A. H. PURDUE, Nashville, Tenn.

Address—"X-ray Development"—DR. W. R. WHITNEY, Schenectady, N. Y.

Address—"The New Things in Science"—DR. F. G. COTTRELL, San Francisco, Cal.

THURSDAY, NOVEMBER 16, 8 P. M.

BANQUET

Address—"Cooperation, the Basis of Safety, Efficiency and Conservation in the Use of the Nation's Mineral Resources"—CARL SCHOLZ, Chicago.

Address—"Organized Capital and Organized Labor and Their Relation to Efficiency, Conservation, Better Wages, Better Living Conditions, Lawlessness, Strike Disorders, and Industrial Freedom"—COL. GEORGE POPE, Hartford, Conn.

Address—"What the MINING CONGRESS JOURNAL is Doing for the Mining Industry"—PAUL WOOTON, Washington, D. C.

FRIDAY, NOVEMBER 17, 9 A. M.

Excursion to Gary, Ind.

METALLIFEROUS SECTION

TUESDAY, NOVEMBER 14, 2 P. M.

Irving T. Snyder, Denver, Presiding; George E. Collins, Alternate Chairman.

Address—"The World's Gold Supply and Its Sufficiency for Business Needs"—Dr. Waldemer Lindgren, Boston, Mass.

Address—"The Mining Industry"—C. A. Tupper, Chicago, Ill.

Address—"The Lead and Zinc Resources of the United States"—C. E. Siebenthal, *U. S. Geological Survey*, Washington, D. C.

Address—"A Tariff for Revenue as Related to a Compensating Duty on Lead and Zinc Ores"—Otto Ruhl, Joplin, Mo.

Address—"The Copper Resources of the United States"—Walter Harvey Weed, New York City.

WEDNESDAY, NOVEMBER 15, 2 P. M.

Will L. Clark, Presiding.

Topic—"Mine Manufacturing the Best Industry of the Rocky Mountain West"—*John Hays Hammond, New York City.

Address—"How to Protect the Small Investor in Metalliferous Mines"—Hon. W. R. Allen, Butte, Mont.

Address—"Smelter Contracts and Market Quotations"—R. M. Henderson, Breckenridge, Colo.

Address—"Copper in Its Relation to Preparedness and Industrial Efficiency"—To be selected.

Address—"The Marketing of Zinc Ores"—W. B. Shackelford, Webb City, Mo.

Address—"Oil Flotation"—Dorsey A. Lyon, Salt Lake City.

Address—"Cooperation in the Lead and Zinc Industry."

Open discussion under 5-minute rule.

THURSDAY, NOVEMBER 16, 2 P. M.

D. W. Brunton, Denver, Presiding; W. B. Shackelford, Alternate Chairman.

Report—Committee on Revision of Mineral Land Laws"—E. B. Kirby, New York, *Chairman.*

Address—"The Foster Bill"—Dr. M. D. Foster, *Chairman House Committee on Mines and Mining.*

Address—"The Revision of Mining Laws," Hon. Chas. S. Thomas, *U. S. Senator from Colorado*—*Frank L. Peckham, Washington, D. C.

General discussion.

Address—"The Rare Metals"—Dr. R. B. Moore, Denver, Colo.

Address—"The Prospector and the Apex Law"—Theo. F. Van Wagonen, Denver, Colo.

Address—"Workmen's Compensation in the Metalliferous Mining Industry"—*Hon. Thomas Kearns, Salt Lake City, Utah.

Address—"Electrolytic Separation"—Fred Laist, Anaconda, Mont.

OIL AND GAS SECTION

TUESDAY, NOVEMBER 14, 2 P. M.

Ralph Arnold, New York City, Presiding.

Address—"The Oil Resources of the United States"—W. A. Williams, *U. S. Bureau of Mines.*

Address—"The Authority of States to Tax Production from Indian Lands"—Hon. J. G. Gamble, *Assistant Attorney C. R. I. & P. R. R.*, Des Moines, Iowa.
Address—"Oil Land Withdrawals"—Judge George H. Patrick, Washington, D. C.
Address—"The Relation of the Federal Government to Western Oil Production"—Gov. James N. Gillet, San Francisco.
Address—"The Federal Government and the California Oil Claimants"—Hon. Jas. D. Phelan, *Senator*, California.
Discussion—Led by Thomas A. O'Donnell, Los Angeles, Calif.

WEDNESDAY, NOVEMBER 15, 2 P. M.

Dr. Norman Bridge, Los Angeles, Cal., Presiding.

Address—"Geology in Its Relation to the Oil Industry"—J. C. McDowell, Pittsburgh, Pa.
Address—"Standardization of Oil Testing Methods"—*W. H. Fehsenfeld, Baltimore, Md.
Address—"The Future of the Dye Industry through the Use of Petroleum"—Dr. Walter F. Rittman, Empire Building, Pittsburgh.
Address—"Practical Phases of the Standard Oil Dissolution, and the Necessity of Combinations Among Independent Producers to Meet Unfair Competition"—R. L. Welsh, Chicago, Ill.
Address—"Federal Cooperation with the Oil Industry"—H. G. James, Kansas City, Mo.

THURSDAY, NOVEMBER 16, 2 P. M.

S. Y. Ramage, Oil City, Pa., Presiding.

Address—"The World's Oil Supply"—Ralph Arnold, New York City.
Address—"Naval Oil Reserves as a Necessity to National Preparedness"—To be selected.
Address—"The Future of the Natural Gas Industry"—*Judge Thomas J. Flannelly, Independence, Kans.
Address—"The Relation of the Federal Government to Scientific Research in the Oil and Gas Industry"—To be supplied.
Address—"Modern Oil Storage"—To be supplied.
Discussion—Led by Alf. G. Heggem, Tulsa, Okla.
Address—"The Chemical Possibilities of Petroleum"—Dr. David T. Day, Washington, D. C.

COAL SECTION

MONDAY, NOVEMBER 13, 9 A. M.

Call for Conference—R. J. Wilson.
Reasons for Calling Conference—J. G. Grossberg.
"What Can Uniform Legislation Hope to Accomplish?"—Van H. Manning.

MONDAY, NOVEMBER 13, 2 P. M.

Address—"Advisability of Preparing Mining Legislation through Commissions"—S. A. Taylor.

Address—"Commission Plan in Ohio"—E. Woodford.
Address—"Commission Plan in Illinois"—A. J. Moorshead.
Address—"Desirable Points of Similarity"—J. E. Williams.

TUESDAY, NOVEMBER 14, 2 P. M.

C. M. Moderwell, Chicago, Presiding.

Report—Committee on Uniform Cost Accounting System—S. A. Taylor, Pittsburgh, *Chairman*.
Address—"Cooperation in the Marketing of Coal"—Ralph Crews, Chicago, Ill
Discussion under 10-minute rule—C. P. White, Cleveland, Ohio; C. G. Hall, Terre Haute, Ind.; R. A. Hord, Lexington, Ky.; W. P. DeArmit, Pittsburgh, Pa.; G. H. Barker, Columbus, Ohio; W. H. Huff, Denver, Colo.; H. N. Taylor, Kansas City, Mo.; W. J. Spencer, Brereton, Ill.; Jas. E. McCoy, Knoxville, Tenn.; T. L. Lewis, Charleston, W. Va.; W. W. Bridges, Drakesboro, Ky.; W. H. Cunningham, Ashland, Ky.
Open discussion under 5-minute rule.
Report—Committee on Workmen's Compensation—T. L. Lewis, Charleston, W. Va., *Chairman*.
Address—"The Cost of Coal"—George Otis Smith and C. E. Lesher, *U. S. Geological Survey*.
Address—"New Ideas in the Preparation of Eastern Coal"—*Warren Roberts, Chicago, Ill.
Address—"The Disadvantage of Wildly Fluctuating Coal Prices"—J. C. Kolsem, Terre Haute, Ind.; D. J. Jordan, Oklahoma City, Okla.; John Laing, Charleston, W. Va.
Address—"Relation of the Federal Government to Uniform State Legislation"—Representative M. D. Foster.
Address—"Uniformity in Miners' Certificate Laws"—H. Fishwick.
Address—"Uniform Compensation Laws"—K. N. Meguire.

TUESDAY, NOVEMBER 14, 8 P. M.

Address—"Suggestions Regarding the Unifying of State Laws"—J. W. Thompson.
Address—"To What Extent Is It Advisable to Control Mining Operations by General Laws?"—R. A. Shiflett.
Address—"Coal Freight Rates Relativity and Uniformity"—R. W. Ropiequet.

WEDNESDAY, NOVEMBER 15, 2 P. M.

Dr. I. C. White, Morgantown, W. Va., Presiding.

Address—"The Colorado Industrial Commission"—Wayne Williams, Denver, Colo
Address—"Cooperation in the Coal Industry"—H. E. Willard, Cleveland, Ohio.
Address—"The Duties of Mine Inspectors"—J. W. Paul, Pittsburgh, Pa.
Address—"The Closed Shop and the Check-off as Related to Efficiency in Mining Operations"—Dorset Carter, Oklahoma City, Okla.
Address—"What Becomes of the Benefits of Production Efficiency"—George H Cushing, Chicago, Ill.
Address—"The Influence of Inter-district Competition on Economy in Southwestern Coal Production"—*J. G. Puterbaugh, McAlester, Okla.; *Harry N. Taylor, Kansas City, Mo.
Address—"Cohesion Among Coal Operators"—*Thomas T. Brewster, St. Louis, Mo.
Address—"The Experience of Anthracite Operators in Storing Coal to Equalize Production"—*E. W. Parker, Wilkes-Barre, Pa.

Address—"The Federal Trade Commission and Uniform Mining Legislation"—E. N. Hurley.
Address—"Uniform Mining Laws as Affecting Safety First"—E. O'Toole.
Address—"Uniform Legislation as Related to the Mine Inspection Service"—John Bohlander.
Address—"Uniform Legislation as Affecting Mining Engineering"—J. A. Garcia.

THURSDAY, NOVEMBER 16, 2 P. M.

J. C. Kolsem, Terre Haute, Ind., Presiding.

Address—"Coal and Its By-Products"—Alfred M. Ogle, Terre Haute, Ind.
Address—"Two Years' Experience in the World's Coal Markets and Its Lesson"—*F. S. Landstreet, New York City.
Discussion.
Address—"After the Association, What?"—W. S. Bogle, Chicago, Ill.
Address—"Unequal Distribution of Bituminous Coal and Its Cost to Operator, Retailer and Consumer"—*K. N. Meguire, Louisville, Ky.
Address—"Wasteful Methods of Coal Distribution"—*Chas. L. Dering, Chicago, Ill.
Address—"Difficulties I Have Met in Coal Litigation and the Remedies"—*R. W. Ropiequet, Belleville, Ind.
Address—"The Future of Coal Export Industry and the Necessities for Its Success"—*J. A. Renehan, New York City.

PUBLIC LANDS SECTION

No set program will be provided for this section.

It will be composed of three special delegates from each of the Public Land States appointed by the Governors, under instructions to sit in conference and to devise a Western Public Lands Policy. To formulate the most comprehensive policy which can meet general approval.

UNIFORM COAL MINING LAW SECTION

The program for this section is being prepared by the Mining Investigation Commission of the State of Illinois and will consist of special delegations appointed by the Governors of the coal producing States. This conference was called by Governor Edward F. Dunne, of Illinois, at the request of the Commission, and will meet in conjuction with the American Mining Congress Convention.

Its purpose is a discussion of Uniform Mining Legislation in the Coal Mining States.

WHAT PRESIDENT WILSON THINKS OF THE MINING CONGRESS

From the message of President Woodrow Wilson to the eighteenth annual convention of the American Mining Congress, held at San Francisco.

> It will always be a tribute to your foresight and energy that while this new Bureau of Mines in the short period of its existence, with the kindly cooperation of State and other agencies, has been able, by persistent and intelligent effort, to turn an isolated, local movement for greater safety into a great national movement for "Safety First," that has already gone beyond the mine industry into every industry of the country. I venture to say that thousands of lives have been saved by that movement, and that many thousands more will be saved in the future.

Membership costs $15 admission and $10 annual dues—which include cost of all its publications and subscriptions to The Mining Congress Journal.

ADDRESS YOUR APPLICATIONS TO

THE AMERICAN MINING CONGRESS
MUNSEY BUILDING
WASHINGTON, D. C.

GEORGE OTIS SMITH
Director of the United States Geological Survey, who will discuss some of the possibilities of Government operations of coal mines in an address at the Mining Congress Convention.

VOL. 2, NO. 11 WASHINGTON NOVEMBER, 1916

THE MINING CONGRESS JOURNAL

Official Organ of the American Mining Congress

VITAL ISSUES TO COME UP AT CONVENTION OF MINERS

In this issue we have much to say of the American Mining Congress, of its past and of its present. The occasion—its nineteenth annual convention which begins in Chicago November 13—warrants some little effusiveness, some little congratulation on what it has accomplished and is accomplishing.

For it is at its great annual conventions that it debates its great issues, summarizes its purposes and resolves upon betterments for the mining industry.

It is clear that so great a task requires not alone the best minds in all branches of the mining industry, but the greatest possible number of men who have given thought to the subjects that are for our joint interest.

And above all it is almost imperative that every mining section in the country be represented, for it is only by knowing all the local conditions that we can act intelligently for the general good.

As an example we call attention to the discussion on "Revision of the Mining Laws" which is to be a notable feature of the convention. While we will have this topic discussed by the Chairman of the House Committee on Mines and Mining, Dr. M. D. Foster, and papers by so great a mining lawyer as U. S. Senator Charles S. Thomas, and so eminent a mining engineer as Theodore Van Wagenan, of Colorado, yet there is such a wide divergence of opinion, many local conditions operating for or against certain vital contentions, that every mining section of the country should be represented in order that the best possible plan of action shall be provided.

This is pertinent also to the discussion on a "Public Lands" policy as it concerns the mining man. Here surely the need of representative opinion lies on the surface, for this is distinctly a western question on which the East requires enlightenment. And it is hoped that every delegate named by the governors to this particular conference will be on hand to aid in formulating a comprehensive western policy. In view of the present legislative situation at Washington we feel that the time is opportune for a campaign to reopen mineral resources to development, to protect the interests of the States, to meet the eastern criticism against fuel and power monopoly, and to work out the conservation that stands for the highest use and the least possible economical waste of the great mineral resources of the West.

These are but two of the many topics which will come before this convention and which will need the presence and the views of every delegate, of every regular member of the Congress, and of all those who are interested in seeing the mining industry uplifted by the influence and the power of united action.

But the benefits of attendance on this convention are not altogether general. There are phases in which the profits strike home at once to the individual and to his business.

For example, there is the topic of "Co-operation in the Marketing of Coal," the initial paper on which will be read by Ralph Crews, of Chicago, largely concerned in developing the Franklin County plan, on which nearly a score of like associations have been formed. For the discussion of this important subject invitations have been sent to and accepted by the secretaries of practically all these organizations.

It is evident, therefore, that every man to whom this subject is of vital interest in his business should not let the opportunity pass of attending and of aiding in the debate.

EFFICIENCY A NECESSITY

The greatest problem of statesmanship is to create conditions under which all may have opportunity to prosper, and all may find lucrative employment. No other condition will prevent want, and starvation is not conducive to a proper respect for law, for property, or for the rights of others. The nation's workers cannot be employed unless there is a market in which the product of that labor can be sold. In a country like the United States, where the productive capacity is in excess of the possible home consumption, there must be an outlet in foreign markets for the surplus production, else, to the extent of the labor required for that surplus production, there must be idleness.

In an address before the third annual National Foreign Trade Convention, Mr. Bernard Suttler, Editor of the Iron Tradesman, Atlanta, Ga., made the following statement: "I have observed this to be true, that whenever the export product falls below $2,000,000,000 a year, or 5 per cent of our total product, we have hard times and our factories are closed down. When it runs to two and a half billions a year, we have a normal business, and when it runs to three billions a year we have a business boom. Therefore, you may say that when we sell abroad 7½ per cent of our annual product, we have thereby created a balance wheel which keeps the various parts of the machine going. Now, as to how we are going to get that product abroad is, of course, a problem we must endeavor to solve.

"In order that we may sell the surplus goods, the cost of this surplus product plus the cost of transportation to foreign markets must not be more than the selling price of similar competitive goods in such market. Given similar quality and cost, superior salesmanship may command the market, but selling efficiency cannot entirely overcome the handicap of excess production cost."

The Mining Congress Journal advocates the highest possible wage, but at the same time it insists that the highest efficiency must be attained in order that our surplus may find a market. The present rapidly increasing price average on all products will be a great and perhaps an insurmountable obstacle when world conditions shall again become normal. The fight for efficiency is daily becoming of greater importance to all classes and particularly to labor.

ONLY REPUTABLE FIRMS ALLOWED TO ADVERTISE

It is within the power of each member of the American Mining Congress to be a great help to the Congress if they will patronize those who advertise in their Journal. No one but a reputable dealer can buy space in The Mining Congress Journal. Each advertisement is scrutinized with the same care as the matter which enters into its news columns.

It does not require additional effort to mention, when placing orders, that you have noticed an advertisement of the firm with which the order is being placed, in The Mining Congress Journal. Many a contract for advertising has been renewed on the strength of a single order which could be identified as return from advertising. We know that the advertisements in this paper are read. We know that the members of the American Mining Congress are doing hundreds of thousands of dollars worth of business with firms whose advertisements appear in this issue. Since the Journal is your property, and any income that may be derived from it goes into the most efficient work that is being done in the interest of the mining industry, we believe it is not asking too much that members give us this additional measure of cooperation.

BIG THINGS BEING DONE BY COOPERATIVE EFFORT

There is what one might term a "common denominator" for every branch of the mining industry—those who mine, those who use mine products—those who transport the production of the mines—those who furnish machinery or supplies.

And that "common denominator" or "mutual interest" applies whether you are a "coal" man, an "oil" man, a "zinc," "lead," "copper," "gold" or "silver" man.

And that converging point where your interest becomes the interest of every other mining man and mining industry is where the American Mining Congress steps in, outlines your joint plans and ideas and fights tooth and nail for them.

The first big thing we accomplished by standing and working together was the establishment of the U. S. Bureau of Mines.

The next big thing we helped to effect was the passage of the most important "safety" legislation of a century and the inspiration of the entire "Safety First" movement in the biggest industry of the country.

Then came its report on Prevention of Mine Accidents," which is now of international import. Then a successful fight for the protection of mining investors—little and big—so that all the facts about the proposition into which they put their money may be known to them.

The Mining Congress had a hand in securing the elimination of the tax on copper in the recent revenue bill and in preventing the application of special taxes to other metals.

Its work on "Standardization of Electrical Equipment in Mines" is a recognized standard in the mining industry—both coal and metal, today.

Now it is busy fighting along every "mutal" line:

For a revision of mining laws.

For larger appropriations by Congress that we may have an extension of Government service along lines to assist practical men in developing the mining districts of the country.

For a public lands policy that spells "development" in the mining sections of the land.

For such cooperation as will enable the operator to pay proper wages to labor, furnish his produce to the consumer at a proper price, and still obtain a fair profit for his capital and enterprise.

These are some of the reasons why it needs your help and why you should join THE AMERICAN MINING CONGRESS.

BUREAU OF MINES HAS EXHIBIT AT NEW YORK CHEMICAL SHOW

The Bureau of Mines participated in the National Exposition of Chemical Industries held at the Grand Central Palace in New York City during the week of September 25.

The space occupied by the Bureau was 100 by 20 feet. The exhibit consisted of five dummy figures representing miners wearing various types of rescue apparatus and otherwise fully equipped for mine rescue work, white chinaware made from all-American materials that had been purified by methods devised by the Bureau of Mines; a model showing the evolution of coal, Bureau of Mines oxygen resuscitator, the lung-motor, Westphalia reviving apparatus, a complete set of miners' electric and oil safety lamps, a working model of an automatic mine door, a Burrell gas detector, Bureau of Mines tool kit, oxygen bird cage, Bureau of Mines first-aid cabinet and surgeons' chest, a set of flash-point testers and scientific instruments used by the Bureau in its laboratories, a Houser automatic analytical scale, several types of fresh-air helmets, several types of ammonia helmets, sand-blast and acid-proof helmets, together with several types of arc-weld helmets, and gas masks such as are used in warfare in Europe.

On the walls were large charts of mining statistics, and a set of safety symbols for use in mines. Samples of carnotite and pitchblende ores were also shown, with an electroscope for determining the radium content of these ores.

During the week nearly 90,000 persons visited the exhibit, among whom were many of the foremost engineers and chemists of the country. The exhibit was installed and was in charge of M. F. Leopold, of the Washington office, assisted by H. J. Nichols.

George Otis Smith, director of the U. S. Geological Survey, expects to be in Maine the week following his attendance at the Chicago convention of the Mining Congress, and will speak in Skowhegan, Me., at a citizens' meeting, November 19, on "Prohibition as a National Issue, and on November 21, before the Sorosis on "Your Share of the Nation's Wealth."

EVERY MINING STATE IN THE UNION WILL BE STRONGLY REPRESENTED AT CONVENTION

American Mining Congress Meeting to be Held in Chicago the Week of November 13, Will Be Greatest Gathering of Mining Men Under One Roof in the History of the Industry—President Names Representative Delegates

A delegation from every mining State in America and representatives from every important mining section of the country will be in attendance when the American Mining Congress Convention opens in Chicago, November 13.

President Wilson has notified Secretary J. F. Callbreath of his appointment of the following delegates: E. H. Benjamin, Oakland, Calif.; H. M. Chance, Philadelphia; Curtis H. Lindley, San Francisco; James MacNaughton, Calumet, Mich.; Van H. Manning, Washington; E. P. Mathewson, Anaconda, Mont.; Charles Piez, Chicago; W. L. Saunders, New York; George Otis Smith, Washington, D. C., and A. H. Woodward, Woodward, Ala.

The conference of coal mining men from the Middle West called by Governor Dunne will be held in conjunction with the Congress. Its conclusions, particularly in matters pertaining to uniformity of laws, will be of national interest.

Wherever possible the railroads have granted a special rate. In Western Passenger Association territory where the rates approximate to 2 cents a mile no further concessions are made to any gatherings. From California and Pacific Coast common points the information is given out that the nine-months tourist rate of one and one-third fares to Chicago and return applies for the period of the sessions of the American Mining Congress.

The Central Passenger Association, which covers common points in Illinois, Indiana. Ohio, Pennsylvania, West Virginia, Michigan, Eastern Missouri, Western New York, has made a 2 cent rate each way. These tickets will be sold November 11, 12 and 13. They have a return limit to November 20. Holders must reach their original starting point before midnight of November 20.

The special sessions in the interest of a western public lands policy will form a most important part of the Congress. Governor Geo. W. P. Hunt, of Ariz., in a letter on this subject, says: "This matter is of such importance that it merits serious attention from each of the western States." Governor Kendrick, of Wyoming, is "of the opinion that such a convention will do much to bring to the attention of the press and public this important work."

"The great difficulty," says James F. Callbreath, Secretary of the American Mining Congress, who is organizing the conference, "has been that the West has had no comprehensive policy, and even western representatives in Congress could not get together upon an intelligent plan for handling this question. The conference will be the means through which we will arrive at a practical solution of the public land problem.

"The belief that the resources which are essential to industrial prosperity should not be permitted to pass beyond public regulation must be considered, but it must also be recognized that the individual States must have the benefit of their own natural resources.

"In view of the present legislative situation at Washington, I feel that the conference is opportune and that it will begin a campaign to reopen mineral resources to development, to protect the interests of the States, to meet the eastern criticism against fuel and power monopoly and to work out the conservation that stands for the highest use and the least possible economical waste of the great mineral resources of the West."

The exhibit, which will take up the seventeenth floor of the hotel, with the exception of two meeting rooms, is now an assured success. Arizona has taken two of the larger spaces for its exhibit. The University of Illinois is preparing a fine educational photographic display. The U. S. Bureau of Mines exhibit, now at Detroit, will be shown and will be one of the main educational features on the floor. H. R. Ameling, of St. Louis, has engaged one of the larger rooms to show twice or three times daily, with moving pictures, the operation of the core drill. Roebling, the Goodman Manufacturing Company, the General Electric, the Justrite Manufacturing Company, Macomber & White, Stephens Adamson, the Link Belt, the Electric Storage Battery Company, of Philadelphia; Stromberg-Carlson, G. L. Simonds, and the Tool Steel Gear & Pinion Company all promise thoroughly representative exhibits. The Mining World, The Engineering and Mining Journal, The Mining and Scientific Press, The Coal Age, and The Black Diamond are among the first of the trade papers to arrange for space.

Particularly interesting will be the discussions on topics pertaining to the oil industry. There will be several interesting papers on the oil resources of the country. In a letter congratulating the Congress on its "oil" program, Rear Admiral John R. Edwards, U. S. N., writing from his home at Bristol, R. I., to Secretary Callbreath, sounds a new note in the country's industrial "preparedness" program.

CARL SCHOLZ

President, American Mining Congress

"The extensive oil shale deposits of the Rocky Mountain region" says the admiral, "offer, far-reaching possibilities to the industrial and maritime interests as well as to the military departments of the nation, and the action of the Mining Congress in giving special consideration to the question is another instance where the engineer is preparing to render an inestimable service in promoting national defense.

"It is by no means improbable that the existing industrial supremacy of the United States may be imperiled if we lose our relative lead in oil production, and therefore who can measure the importance of the service that has been rendered even in the past two years by the mining engineers of the country in pointing out the extent and character of the oil shale deposits of the United States. For it is in the direction of the retorting and distillation of the vast areas of shales of minable thickness and commercial richness that we must look to retain our lead in the production of the commercial petroleum products. The development of these shale areas ought to be one of the industrial responsibilities of the nation. In this work the mining engineer ought logically lead the advance."

The convention promises in its program to make the technical side of many important questions understandable to the layman. Thus, in addition to the moving pictures of the "core drill," there will be a great mass of interesting still and action pictures in connection with the various educational exhibits. Dr. Henry Mace Payne's lecture on the frozen gravels of Alaska and Siberia will have some marvelous films to supplement the discourse. Other moving pictures will show the effects of explosions in coal mines. There will be moving pictures of the big Mexican oil gusher, the Cerro Azul, of Mexico, to be shown and lectured upon by E. L. Doheny, of Los Angeles.

The address of Dr. Willis R. Whitney, who has been doing some wonderful research work for the General Electric Company, promises to be a feature of the convention. It is to be on the subject of the "Necessity for Research Work in the United States." It is to be a clarion call for national aid such as is given to the great research laboratories abroad.

On the general subject of "Safety," which is to be the feature of the morning session November 14, there will be several notable addresses. These will be followed by a discussion on the "Responsibilities and the Duties of the Operator, the Miner, and the Public."

For the general session Wednesday, when the subject will be "Efficiency in Mining Operations," there will be on hand a group of the country's greatest experts. Van H. Manning, Director of the U. S. Bureau of Mines, will speak on "Federal Aid in Mining Efficiency." The "Federal Trade Commission and the Mining Industry" will be discussed by Chairman E. N. Hurley, of the Federal Trade Commission. Charles M. Moderwell, a member of the executive committee of the American Mining Con-

J. F. CALLBREATH

Secretary, American Mining Congress

C. M. MODERWELL
Director, American Mining Congress

gress, will have an interesting report to present from the "Committee on Relations with the Federal Trade Commission."

For the general session Thursday, the subject will be "Conservation." On this day Dr. Whitney's address, which already has been mentioned, is expected to give occasion for a great deal of discussion.

President Carl Scholz, of the Mining Congress, will speak on "The Conservation of Property."

The section meetings, many of the topics for which were published in the October journal, promise much in the way of information that will be of great value to coal, oil, zinc, lead, copper, and precious metal mining men.

The address of Ralph Crews, of Chicago, on the subject "Cooperation in the Marketing of Coal" is to be followed by a discussion to which the secretaries of leading American Coal Marketing Associations have been invited. A sufficient number of acceptances assure a most thorough review of the entire subject. In fact, the interest in the matter is so great, that the time of the debate will probably be extended.

The address on "The Federal Petroleum Bureau," by H. G. James, of Kansas City, will be the occasion for a warm discussion in the oil section. Dr. J. C. McDowell's paper on "Geology in Its Relation to the Oil Industry," is one that will greatly interest men in the oil industry.

Frederick Laist's paper on "Electrolytic Separation," gives promise of some revelations of intense interest in the way of improved processes.

In the coal section, the paper to be read by H. T. Willard, of Cleveland, on "Cooperation," will drive home some great needs of the coal industry.

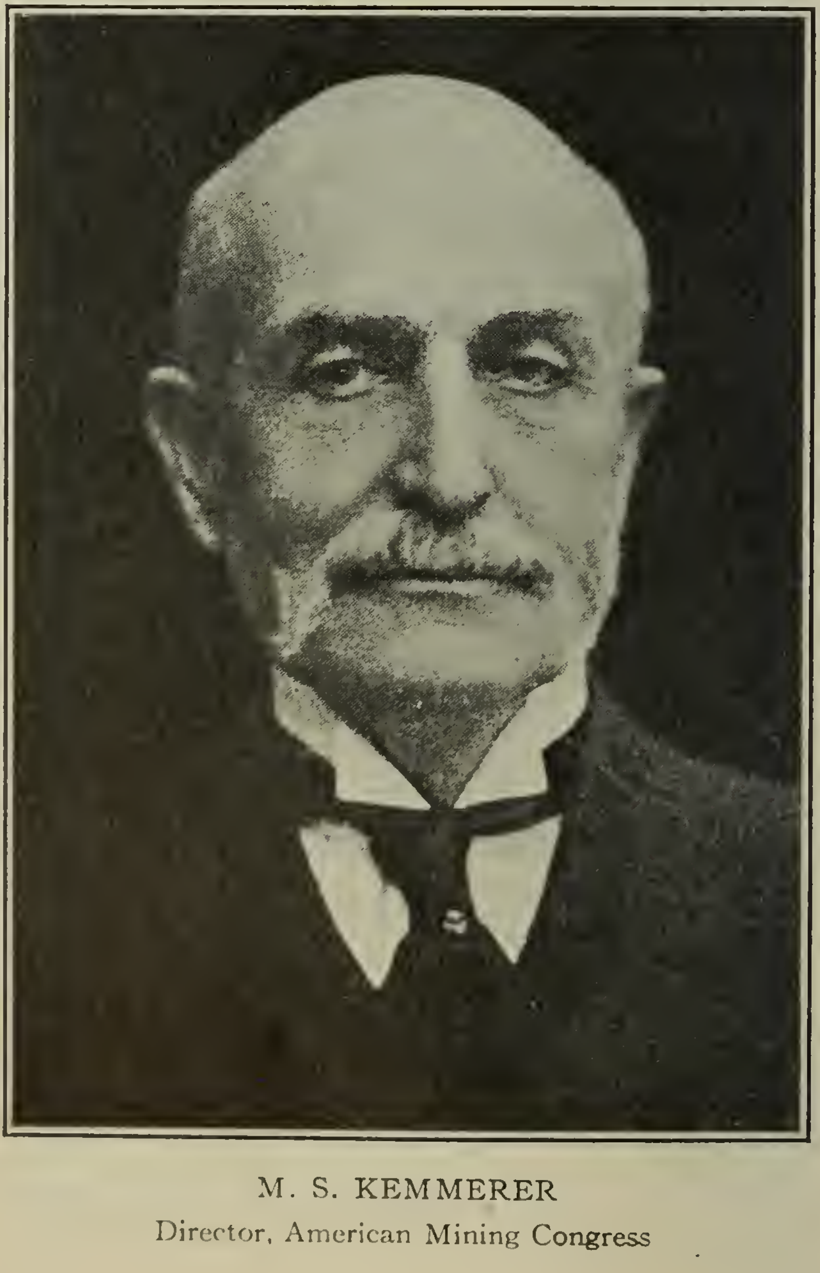
Dr. F. G. Cottrell's paper on "New Things in Science" is awaited with considerable interest, as he is the scientist who has had much to do with the progressive work done in the past two years by the U. S. Bureau of Mines in the improvement of metallurgical processes.

The assured success of the convention is due to a great extent to the splendid work of the local committee and the unstinting labors of the president of the Congress, Carl Scholz, of Chicago.

The details of local entertainments are now being prepared. The banquet will be in every way notable. Luncheons and one or two excursions to neighboring plants are also under consideration.

PROCEDURE CHANGED

For the first time in the history of its conventions the American Mining Congress has decided to devote the morning hours to the general meetings, and the afternoons to specific mining industries—metal mining, coal and oil. Each of these sections will have its own meeting room, and topics which are of interest to those in that particular industry will constitute the programs. Thus for the first time the sessions



M. S. KEMMERER
Director, American Mining Congress

CHARLES S. KEITH
Director, American Mining Congress

of the American Mining Congress will assume some of the aspects of distinctive industrial organization meetings. It is hoped that the attendance and discussions will warrant a continuance and an expansion of the idea of sectional meetings in connection with the regular conventions of the American Mining Congress.

PRESIDENT SELECTS NOTED MEN AS A. M. C. DELEGATES

The delegates appointed by President Wilson to represent the United States-at-large at the coming convention of the American Mining Congress comprise a group of highly trained and splendidly equipped men along practically every line of mining endeavor

E. H. Benjamin, of Oakland, Cal., is a mining engineer, formerly general manager of the Joshua Hendy Iron Works of San Francisco. Formerly secretary and later president of the California Miners' Association. Member, American Institute of Mining Engineers.

H. M. Chance, of Philadelphia, Pa., is a mining engineer and geologist. Associate geologist of the Pennsylvania Geological Survey, geologist in charge of exploration of coal fields in North Carolina; manager of iron mines in Pennsylvania; assistant engineer in tunnel work; general consulting practice as mining engineer and geologist since 1887 Member, American Institute of Mining Engineers; American Philosophical Society; Engineers Club of Philadelphia. Mining and Metallurgical Society of America; Author of several geological reports and technical papers.

Curtis H. Lindley, San Francisco, Cal., is a lawyer, a member of firm of Lindley & Eickhoff. Honorable Professor, Department of Jurisprudence, University of California, since 1900. Member of California Academy of Science; associate member of American Institute of Mining Engineers; author, "American Law Relating to Mine and Mineral Lands, within the Public Land States." An authority on mining laws.

James MacNaughton, of Calumet, Mich., is a mine manager. Second vice-president and general manager of the Calumet and Hecla Mining Company, and general manager of all of its subsidiary companies. Member, American Institute of Mining Engineers; Institution of Mining and Metallurgy (London).

Van H. Manning, of Washington, D. C., is the Director of the U. S. Bureau of Mines.

E. P. Mathewson of Anaconda, Mont., is a metallurgist. Assayer, 1886–9, superintendent, 1889–97, Pueblo (Colo.) Smelting and Refining Co.; joined Guggenheim's Sons technical staff, 1897; was superintendent and manager at Perth Amboy, N. J., at Monterey, Mexico, and at Antofagasta, Chile, until 1902; in employ of Anaconda Copper Mining Co., 1902, first as superintendent of blast furnaces at Anaconda, then superintendent of entire plant; now manager

L. A. FRIEDMAN
Director, American Mining Congress

of Washoe Reduction Works of the company at Anaconda. Was manager, until January 1, 1913, of International Smelting and Refining Company's western plants. He erected the plants at International, Utah, and East Chicago, Ind. Member of the Montana State Game and Fish Commission; director, Hearst Free Library, Anaconda; member, American Institute of Mining Engineers; Institution of Mining and Metallurgy, London (gold medal, 1911); American Chemical Society; Society of Chemical Industry, London; contributor of technical articles on metallurgy to technical press and Transactions of Institute of Mining Engineers; inventor of various improvements in blast and reverberatory furnaces for smelting copper and lead ores.

Charles Piez, of Chicago, Ill., is president of the Link Belt Company, and is a member of the American Institute of Mining Engineers.

W. L. Saunders of New York City is an engineer; former president of the American Institute of Mining Engineers; a distinguished engineer and man of affairs, who has given much time to the invention and manufacture of rock-drilling machinery. Member of the American Society of Chemical Engineers; Society of Mechanical Engineers; National Civic Federaation; New York Chamber of Commerce; president, Ingersoll-Sargent Drill Company, and chairman of the Board of Directors of the Ingersoll-Rand Company.

George Otis Smith is the director of the U. S. Geological Survey.

A. H. Woodward, of Woodward, Ala., is vice-president of the Woodward Iron Company, and a member of the American Institute of Mining Engineers.

EIGHT-HOUR DAY IN FORCE IN MOST OF SOFT-COAL MINES

In most of the bituminous coal mines of the United States the length of the working day is 8 hours. In 1915, out of a total of 5,076 mines for which the number of hours worked per day were reported, 3,018, or 59.5 per cent, worked 8 hours; 910, or 17.9 per cent worked 9 hours; and 1,148, or 22.6 per cent, worked 10 hours. The corresponding percentages in 1914 for 5,189 mines were 60, 17.5, and 22.5. The 8-hour mines employed in 1915 a total of 325,308 men; the 9-hour mines, 92,838 men; and the 10-hour mines, 127,268 men. In comparing the figures for 1914 and 1915 it will be noted that although there was a decrease in the total number of men employed, the number of mines and the men working 9 hours showed an increase, the States of Alabama, Kentucky, Ohio and West Virginia being noteworthy examples. Most of the same States show corresponding decreases in 8-hour and 10-hour operations. Other evidence points to the gradual shortening of length of working day, and the inference is that fewer 8-hour mines were operated rather than that any increased their length of working day.

It should be remembered, however, that when the length of the working day is stated, reference is made to the number of hours the mines are supposed to have been in operation, and not to the number of hours worked by the miners. In both the anthracite and the bituminous fields practically all the coal is mined by contract at an agreed rate per ton or other basis of payment. The miner is an independent contractor and is not obliged to put in a certain number of hours at his working place.

Since the settlement of the anthracite strike of 1912 and until the new agreement in 1916, the mines in that region have been operated on a 9-hour basis, with the exception of engineers and pumpmen, who work 8 hours, and of the miners, who work by contract.

SIGNIFICANCE SEEN IN CLOSE ORE ASSOCIATION WITH ANDESITE

Henry G. Ferguson, of the United States Geological Survey, discussing the Golden Arrow, Clifford and Ellendale districts of Nevada, says:

The three districts, although varying in the nature of their ore, show certain features in common. The deposits belong to the class of shallow vein deposits in which the mineralization followed closely the extrusion of lavas, or the welling up of intrusives that reached close to the surface. In each case the occurrence of the ores in close association with andesite is significant. It may be that one of the principal periods of Tertiary mineralization is to be associated with an epoch of andesitic volcanism. In the Manhattan and Tonopah districts there are masses of similar andesite, intrusive at Manhattan and occurring both as flows and intrusions at Tonopah, but in the Manhattan district the relations of the andesite and ore are not clear, and at Tonopah, according to Spurr, the ores of the different periods of vein formation are associated with rhyolite rather than with andesite.

At Clifford and Ellendale jarosite, a sulphate of iron and potassium, takes the place of part of the limonite as a result of the oxidation of pyrite. It is believed that the potash necessary to form this mineral has been obtained from the rhyolite.

BRITISH COLUMBIA COMPANY INSTALLING PUMPING PLANT

The British Columbia Copper Co. is installing a pumping plant to elevate the water from the Similkameen River to a distributing point 1,700 feet above the river, through a pipe line 6,000 feet long, according to reports to the Department of Commerce. The equipment will consist of triples pumps, and the pump line will be composed of 4-inch high-pressure hydraulic pipe in the lower station and steel pipe of 6-inch diameter at the discharge.

The water will be used to supply the mine, the camp, and a 50-ton experimental mill, which will be used for the working out of a concentration process preliminary to the erection of a 2,000-ton plant on the Similkameen River.

CONGRESS PROBABLY WILL PASS FINALLY ON LEASING BILLS AT NEXT SESSION

Success of Such Legislation Will Mean that Such a State as Colorado Will Have To Pay a Minimum Federal Tax of $250,000 on Its Coal Output — Question to be Discussed at Convention

Chicago, October 10.—"Had the present coal production of various western States been under a federal leasing system at the lowest rate of royalty which has ever been considered, such a State for instance as Colorado would now be paying upon its present coal production approximately a quarter of a million dollars annually to the federal government and the State would have been deprived of whatever taxes it now receives from its coal resources."

This statement is made by J. F. Callbreath, secretary of the American Mining Congress, who has just returned from a trip to the West in the interest of the nineteenth annual convention to be held at Chicago, November 13, 1916.

Elaborating this thought Mr. Callbreath went on to state that under a federal leasing system at the lowest rate of royalty which has ever been considered, Wyoming would be paying upon its present coal production approximately $125,000 annually. Washington $160,000, Utah $150,000, Montana $155,000, New Mexico $50,000 annually.

"The convention of the American Mining Congress," says Mr. Callbreath, "will afford an ideal opportunity for the West to present its claims to representatives from the eastern mining States whose congressional representation acting with western members can prevent unwise legislation and bring about the enactment of laws which will stimulate the development of western resources.

"Whether the Ferris Land Leasing bills shall be enacted or whether the amendments made by the Senate Committee shall prevail is of vital importance to the West. Whether the California Oil Claimants, whose rights are based on a compliance with the U. S. Land Office regulations then in force, shall be robbed of their property without right of appeal to the courts, as the Alaskan Coal Claimants have been, is of vital importance to every loyal citizen.

"Whether the resources of the West are to pay endless tribute to the National Government through a federal leasing system or whether these resources shall be subject to the taxing power of the States, concern directly every taxpayer. Whether a cumbersome agency two thousand miles away without knowledge of conditions shall control western development or whether the basic principle of republican government, home rule, shall prevail, and our development be controlled by those who know, is one of the most important and pressing questions now facing the West

"The coming session of Congress at Washington will probably pass finally upon these questions. The leasing bills have passed the House of Representatives and are now before the Senate. Western Senators are entitled to great credit for the work thus far accomplished.

"The Senate is likely to approve the work of its committees, but unless the West shall rally to the support of the Senate Committee recommendations there is great danger that the House of Representatives may refuse its approval.

"Legislation along several lines of great importance to the West will be thoroughly discussed by those interested in the development of the western States, at the Mining Congress convention."

Discussing the various issues now pending before Congress, Mr. Callbreath said: "The next session of Congress will have under consideration the Foster Bill, for revision of mineral land laws of the West."

It will be recalled that a bill to investigate conditions at its public hearing in the western mining centers, making recommendations to Congress, was introduced by Senator Smoot, and passed the Senate, but failed to receive the approval of the House Committee on mines and mining.

In its stead Dr. Foster, chairman of the committee, introduced a bill intended to meet the requirements without the preliminary work of the Commission. This bill was severely criticized by the West and the mining journals. A thorough discussion of the subject will take place at the Chicago convention. Dr. Foster himself will lead the discussion and convey the plan he proposes. The discussion will be lively if the critics of his bill meet him on the floor.

SOME COALS CANNOT BE CLEANED BY HAND PICKING

Not all coal can be cleaned by hand picking. Some coal beds or parts of beds have layers or benches of slate and bone or contain more than the allowable quantity of sulphur in the form of iron pyrite so thoroughly mixed with the coal that crushing is necessary to free the coal from the refuse. For such coal washing is resorted to and, the coal being lighter than the refuse, is separated by currents of water. Coal is also cleaned in the dry state, and the product of one large company in Illinois is so treated, the results being included in the statistics of washed coal. A large part of the washed coal is slack used in the manufacture of coke, notably in Pennsylvania and West Virginia. This information was obtained by the Geological Survey.

VAN H. MANNING
Director, Bureau of Mines

THOROUGHNESS OF SURVEY'S RESOURCES DEMONSTRATED

Inquiry of the Geological Survey by one of the largest industrial corporations of the country regarding the possibility of obtaining a granite in this country similar to that found in a certain part of Europe developed an interesting case of the economic value of one of the Survey's scientific collections.

For a number of years the geologists of the Survey have been interested in securing additions to a reference collection of rocks from all parts of the world, the purpose being, however, a working collection for use in comparing rocks being studied in various parts of the United States. This collection now contains over 2,000 specimens, the great number of which have been analyzed by the chemists of this and other countries. It is by reason of this collection that the Director of the United States Geological Survey was able to reply at once that the Survey had samples of at least six granitic rocks from the localities mentioned with an analysis of each, which would enable the company's representative to get the information desired.

MUD-LADEN FLUID STOPS WASTE OF NATURAL GAS

"One of the most shameful wastes of this country's natural resources has been that of natural gas in the oil fields," says James O. Lewis and William F. McMurray, of the Bureau of Mines. "This waste has been occasioned very largely by not having efficient and cheap methods of controlling the gas, nor adequate laws and regulations to enforce the control.

"Soon after the establishment of the Bureau of Mines, investigations were started with the view of finding means of lessening this waste. In 1913 engineers of the Bureau of Mines were sent to Oklahoma to investigate the waste and to recommend methods for its prevention. These engineers recommended the mud-laden fluid system, which had been previously used in Texas and California, and demonstrated that the method was equally applicable to the conservation of gas in the mid-continent and eastern fields."

USE OF LIGNITE INCREASES IN NORTH DAKOTA INDUSTRIES

Practically all the lignite mined in North Dakota is used within the State, and nearly one-half is consumed at the place of production, not even being loaded on railroad cars. The increase in population is followed by greater use of coal, and although lignite, except in the remoter districts, is not largely used for domestic fuel, the industries, such as brick making, that do use lignite, are growing, and with their growth the production of lignite has increased steadily.

FAMOUS MARYLAND COALS ARE ABOUT WORKED OUT

Of the coal for which Maryland is famous, it is generally understood that the Elk Garden is entirely worked out and that the Big Vein George's Creek is fast approaching exhaustion according to the Geological Survey. When the extent of the lower but thinner beds is more fully realized and when labor can be obtained to mine these thinner beds at rates comparable with those in fields in adjacent States, the production of Maryland may be expected to increase again to the record output of about five and a half million tons of 1906 and 1907.

Orders Mill by Wire

The Talkeetna Mining Company of Seattle, Wash., is building a mill on their property near Knik, Alaska. They have ordered by wire from the Denver Quartz Mill & Crusher Company, for shipment at earliest moment, a Denver Quartz Mill and Feeder. This is the third shipment of Denver Quartz Mills that has gone into the Knik district in the past twelve months.

OIL INDUSTRY OF U. S. SAVED $50,000,000 BY AN APPROPRIATION OF $35,000

Hostility Which Marked Entrance of Bureau of Mines into Oil Fields Disappears When the Logic of Its Conservation Policy Becomes Evident—Ambitious Oil Program Being Carried Out by Bureau

By an expenditure of $35,000, the Bureau of Mines is in position to prove concretely that it has saved a minimum of $50,000,000 to the oil industry of the United States. There is reason to believe that the total saved as the result of the Bureau's work reaches a higher figure, and it is certain to continue increasing with the more extended application of the methods which it recommends.

The whole purpose of the petroleum work of the Bureau of Mines may be summed up in the statement "that it is working for the elimination of unnecessary waste and for the conservation of the country's petroleum resources." The Bureau is endeavoring to introduce the most efficient methods of drilling—methods that will not only conserve the natural gas, but that will protect the oil sands from premature flooding by water. The Bureau is ready to demonstrate any of the methods it recommends. It has practical engineers in its employ to perform these services.

When the Bureau entered the Oklahoma field three years ago, the method of drilling in vogue allowed a large percentage of the natural gas to waste to the atmosphere. The Bureau's engineers demonstrated, by actual drilling of wells, that by the use of the methods recommended by the Bureau it is practicable to drill oil or gas wells without wasting commercial quantities of gas. After three years' work, the value of the Bureau's methods are fully appreciated in Oklahoma, and has resulted in the universal adoption by the more progressive operators of this method, not only in the Oklahoma fields but in the Kansas field. In the latter case the operators were mostly from Oklahoma, however, and they adopted the method voluntarily. It is the object of the Bureau of Mines to extend this method to other States where it may be applicable. It is ready to cooperate with the producer in order to better drilling methods in any field. The Bureau's engineers have consulted and conferred with operators throughout the United States, giving them the benefit of their experience.

WOULD INCREASE OUTPUT

The Bureau is also carrying on an investigation with the view of increasing the recoverable percentage of oil from sands. By the present methods this recovery is less than 50 per cent. The Bureau's investigation will call attention to the possibility of increasing this percentage.

An investigation is also being conducted as to the best methods of protecting oil sands from infiltrating waters with the view of placing the information before the operators.

An investigation, also, is in progress on oil storage. This is being conducted with the view of preventing losses from evaporation and fire. The Bureau is calling attention to the unusually high aggregate of these losses. The comparative cost of different kinds of storage is also being furnished oil operators interested. The matter of protecting oil tanks from lightning is the object of special consideration just at this time. A report covering the findings of the Bureau, in this regard, is to be published in the near future.

Statistics are being compiled in the various fields showing the rate of decline and the ultimate production from these fields.

WOULD REDUCE COST

The drainage of oil sands and the spacing of wells is to come in for important consideration with the view of reducing the cost of drilling to a minimum.

Cracking of petroleum has called forth intensive investigation by the Bureau. The results of this work have been of great value to the oil industry. Without the Rittman process, it is believed the independent oil refineries, eventually, would be put out of business as the Rittman process is the only one which offers real competition to the Burton process, which is controlled by the Standard Oil Company. This work, also, it is expected will provide the means for the utilization, for motor purposes, of a large amount of petroleum which is not now used

The Bureau is carrying on various research problems dealing with the chemistry of petroleum. It is cooperating with numerous refineries who are developing the Rittman process, and in addition to this, the Bureau is cooperating with the Navy Department and is to supervise the testing of the naval reserves.

COOPERATES WITH OTHER BUREAUS

In cooperation with the Bureau of Indian Affairs and with the General Land Office, the Bureau is looking after the development of oil on Indian and public lands.

An investigation which is attaining much greater importance is that pertaining to oil shales. This work will include, during the present year, the investigation of Scottish practices by the Bureau of Mines engineers. Statistics are being collected as to the refined products of petroleum with the view of publishing this data annually, or oftener.

The total appropriated for the petroleum work for the Bureau of Mines is $70,000 this year. This is the total amount requested by the Bureau. Quite contrary to the experience of the Bureau of Mines and Geological Survey in other branches of mining, Congress has shown no disposition to be niggardly in its appropriations for oil investigation work.

The petroleum work of the Bureau of Mines is under the immediate direction of William A. Williams, the chief petroleum technologist. Much of the Bureau's success in this field is attributed to the tact and intelligence of Mr. Williams.

DISCRIMINATORY FREIGHT RATES ALLEGED BY OHIO OPERATORS

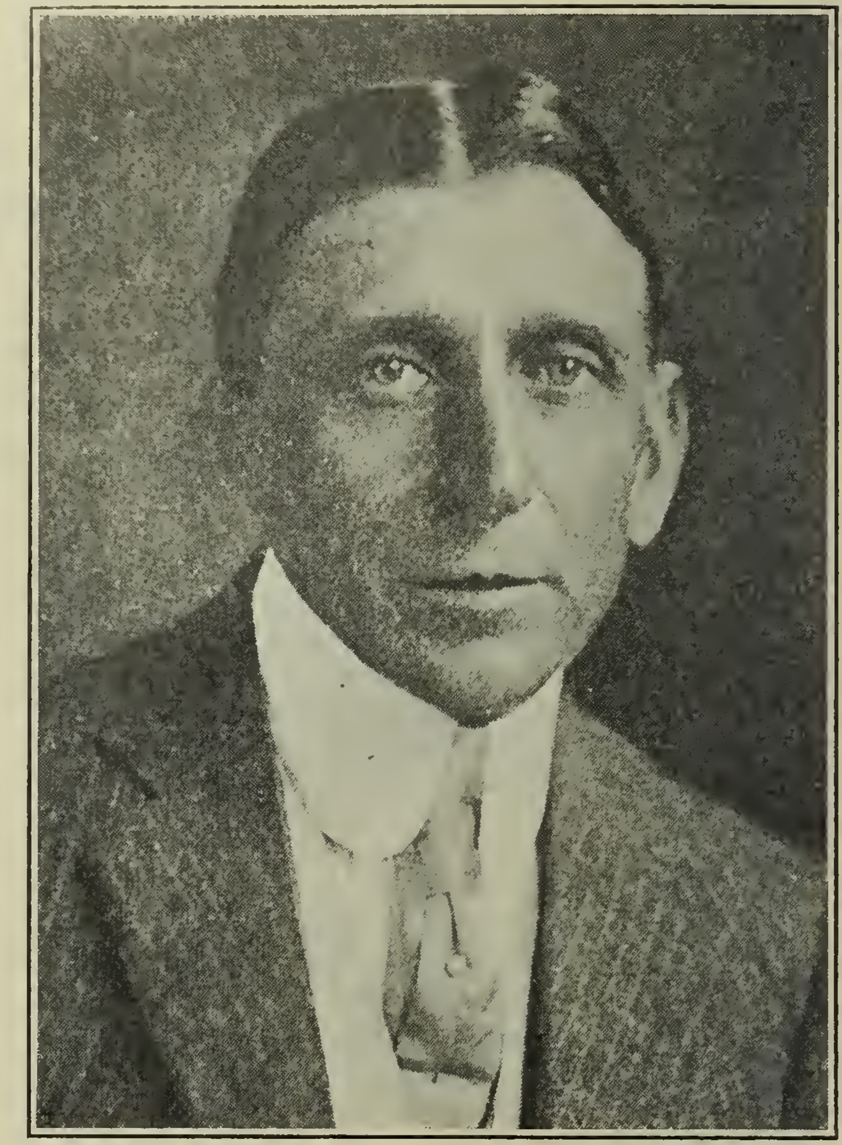
Ohio operators, especially those in the Hocking district, state that they are at a disadvantage, compared with West Virginia, because of unfavorable freight rates, comparatively higher mining rates, and the recognized superiority of the West Virginia coals for steam purposes. In the last few years Hocking coal has lost its position at the head of the Lakes as a steam coal to West Virginia and eastern Kentucky coals according to information given out at the Geological Survey. Railroads no longer give preference to Ohio coal and it is reported that the roads using this coal have reduced their consumption by perhaps 30 per cent through economies effected by the use of new mechanical devices for firing. Competition with outside fields for the markets within the State of Ohio is very keen, and Ohio operators are endeavoring to have the intrastate freight rates adjusted in such a manner as to enable them to control the major portions of this market.

PAN-AMERICAN PAPERS WILL BE READY APRIL 1

The Sixty-fourth Congress, First Session, appropriated in the Urgent Deficiency Bill $42,000 for the preparation and printing of the papers of the Second Pan American Scientific Congress. These papers will be printed in the language of the original.

The papers are being edited under the direction of Dr. Glen L. Swiggett, the Chairman of the Committee on Publication. The following members of the Executive Committee are associated with Dr. Swiggett in this work: W. H. Holmes of the Smithsonian Institution; Gen. W. H. Bixby, and George M. Rommel, of the Department of Agriculture.

It is expected that the proceedings will be printed and ready for distribution by April 1, 1917. The edition will be a limited one. Copies will be sent to the libraries of learned and scientific institutions and associations and to the leading universities of the twenty-one American Republics. Requests from individuals should be sent for file to Dr. Swiggett, 1423 New York Avenue, Washington, D. C.



WALTER DOUGLAS

Director, American Mining Congress

STEAM-SHOVEL MINING IS INCREASING IN COAL FIELDS

For the first time statistics have been collected by the United States Geological Survey to show the quantity of coal recovered from steam-shovel pits. The figures for 1914 were not complete and, although a comparison with 1915 can not be made, it is known that there was a large increase in this new branch of coal mining. The bituminous coal recovered from steam-shovel pits was only 0.6 per cent of the total, but in Indiana, Kansas, and Missouri the coal thus mined represents a notable part of the whole.

Mining conditions in the Pennsylvania anthracite region, where the beds are steeply inclined, faulted, and folded, are quite different from those in the greater part of the bituminous regions, where the beds are usually quite regular and approximately horizontal, and the methods pursued in recovering the coal are therefore quite different in the two areas. For the most part, anthracite is shot from the solid and the practice in that region does not appear to have met with the objections that have developed in the bituminous fields. Machine mining in the anthracite region has not been developed to any great entent, and less than 2 per cent of the total product is recovered in that manner. In fact, the quantity taken from steam-shovel pits is nearly as great as that mined by machines.

AMERICAN MINING CONGRESS, NINETEEN YEARS OLD, HAS HAD EVENTFUL CAREER

A Charter Member Gives Historical Account of Organization That Has Been Working to Unite and Direct the Energies of an Industry Struggling to Proceed along Most Intelligent and Effective Lines

By a Charter Member

The American Mining Congress was organized nineteen years ago, at the height of the agitation for free silver coinage. In Colorado, where mining men felt the great need of cooperation in matters pertaining to the industry which had just received its most serious setback, the idea was born. And strange to say its first rather indefinite purpose was to have a "Gold Mining Convention." Over in Gilpin County, where vast fortunes, both in silver and gold, had been taken out of the ground, there, at the home of the late Senator Henry M. Teller, the greatest of "silver" zealots, were men who believed that "gold was also an important factor in the economy of the world." In fact, all over the State there was this feeling of getting down to business on a "gold-mining basis".

And on July 7, 1897, the delegates assembled in Denver and elected former Gov. Alva Adams, as temporary chairman. The representation was excellent. When the inevitable free-coinage resolution had been debated, when all the rancor of the previous two years of free silver discussion had been fairly well boiled out of the convention, the delegates started in to do something tangible for the mining industry. It was termed the International Gold Mining Congress, and under this name it labored for five years.

At the very outset it gave itself the task of agitating for the creation of a Federal Department of Mines and Mining. The resolutions adopted had the right ring, but no concerted effort was made to put them into effect. The second meeting of the congress was held in Salt Lake City, former Gov. L. Bradford Prince, of New Mexico, presiding. The honor of the first actual presidency had been given him at the Denver convention.

The third convention of the Congress was held in Milwaukee in June, 1900, Col. B. F. Montgomery, of Cripple Creek, former lieutenant governor of Colorado, presiding.

In 1901, in the convention at Boise, Idaho, Gov. Prince was again chosen president. The fifth convention was held at Butte, Mont., and all of the movements which had received previous endorsement were again made a prominent feature of the proceedings.

These early years of the Congress comprised its formative epoch. The best mining men of the country, men who knew what was needed to rehabilitate the industry, took an interest in the affairs of the Congress. At the sixth annual convention which was held at Deadwood and Lead, S. D., Hon. J. H. Richards presided.

As a matter of fact the real history of the American Mining Congress, the period of effective labors, begins with the Portland convention, in 1904.

Now it was that the great mining engineers of the country began to take part in its deliberations. Government experts appeared at conventions with important papers. In 1904, for the first time, the president was persuaded to appoint delegates. Great men now proffered advice, and realized that only by such cooperation as the American Mining Congress furnished, could the mining industry be uplifted, and made a great power in the United States. Men like Charles W. Goodale, S. A. Taylor, James W. Malcolmson, Dr. James Douglas, D. W. Brunton, Hennen Jennings, Walter Renton Ingalls, J. Parke Chaning, Edward B. Kirby, S. W. Mudd, John Hays Hammond, J. R. Finlay—to mention only a few of the many prominent engineers who are now among its most active members—took a hand in its deliberations. From this time on the resolutions passed by the Congress were accepted by legislatures and by both Houses at Washington as authoritative in the mining world.

Hon. J. H. Richards continued as president during the sessions at Portland, in 1904; at El Paso, Tex., in 1905; at Denver, in 1906; at Joplin, Mo., in 1907; and Pittsburgh, in 1908; and at Goldfield, in 1909.

In 1904, at the Portland convention, James F. Callbreath became secretary, and permanent headquarters were established at Denver. The American Mining Congress now became a tremendous factor in the development of the mining industry of the country—perhaps the greatest factor.

Out of the early propaganda for a Mining Department came the more practicable demand for a Bureau of Mines. Of this the late Dr. J. A. Holmes, who was its first director, said at the meeting following the establishment of the Bureau: "This movement for appropriate recognition and aid for the mining industry from the National Government has been under way for many years. Among its early and most active supporters have been the California Miners' Association and the American Mining Congress. It is, therefore, eminently appropriate that at the first session of the American Mining Congress, following the creation of the Bureau of Mines, at a session held in California, something should be said of the policy and purposes of the new Bureau." And in outlining these purposes Dr. Holmes expressed the thought that he

HARRIS & EWING
WASHINGTON D.C.

SECRETARY CALLBREATH AT HIS DESK IN THE WASHINGTON OFFICE.

would continue to lean heavily upon the American Mining Congress for the expression of what would be best for the mining industry in the future. It was at the sessions and from the men in charge of the work of the American Mining Congress that he hoped to get his inspiration for the labors which were so close to his heart.

But the history of the American Mining Congress can now best be told in the great utterances of its leaders, in the splendid committee work, in the resolutions passed, and in the determination to accomplish what had been resolved upon.

History is never a mere narrative of meetings and elections. It is, or rather should be, a chronicle of the spirit of cooperation by which men uplift themselves as well as their industry.

At the meeting of the American Mining Congress in Joplin, in 1907, Dr. J. A. Holmes, who, as has already been stated, later became the first head of the Bureau of Mines, made this epochal utterance: "We are going to ask this Mining Congress to march into the coal fields and capture the help of the mining interests in the central portion of the United States. Then with the concentrated effort on the part of the mining men from all sections of the country we may be prepared to obtain the cooperation and help from both the Federal and State Governments to which we claim the mining industry is entitled. We are today using up our mineral resources so rapidly that we are consuming both our own share and the share belonging to the future. We are dealing with great national problems as never before in the history of our mineral development; and we must consider and solve these problems in a true national spirit. In this connection the American Mining Congress must capture the East and the South as it has the West. Let us, therefore, hold our next two meetings, one in the heart of the Mississippi Valley coal fields, and another in the heart of the Alleghenies, probably at Pittsburgh. We will thus gain in Eastern membership and influence, and will become truly representative of the great American mining industries. We will then, the more easily, accomplish the great national purposes for which we have our being."

Impromptu as was the utterance, it was in a way climacteric. For true to his prediction, the next meeting was held at Pittsburgh, and the East opened its heart to the Congress. In fact within two years and by reason of the tremendous help given the original idea by the coal interests of the country, Congress passed the act creating the Bureau of Mines.

The successful battle on the flotation of worthless mining stock by unscrupulous promoters took definite shape at this meeting.

At this time, also, the objects of the American Mining Congress had crystallized into clear-cut issues, all of them of vast importance to the mining interests of the country. These had been carefully prepared by the officials, and President Richards, in reading them, said: "These summarize just what was presented to Secretary Garfield, and which seemed to him to justify us in our claim to the right to a Department. The American Mining Congress believes that the mining industry will be uplifted:

"1. By the granting of continued and larger appropriations for the investigations by the Geological Survey, so that the results may be reached rapidly enough to more nearly meet the growing needs of the country, including:

"(*a*) The classification of the public lands;

"(*b*) The exploration, surveying and mapping of the geological formations, ore bodies, mineral deposits, etc.;

"(*c*) The investigations of the nature, extent and origin of these deposits and of the origin of the soils of the country.

"2. By the establishment at this time of a Bureau of Mines, with ample authority and funds for the investigation of, and inquiries into:

"(*a*) The methods and processes employed in the mining and quarrying industries and in the handling and treatment of mineral products with a view to aiding these industries, preventing mine and quarry accidents, and recommending appropriate legislation;

"(*b*) The wise utilization and conservation of our mineral resources through the prevention of waste, the development of more efficient methods, etc.;

"(*c*) The mining conditions, and the most efficient methods for the handling, treating and using of ores and other mineral products in foreign countries, with a view to benefitting American mining, quarrying and other mineral and metallurgical industries;

"(*d*) The publication, in such form as to be really available, of the information obtained from all these investigations and inquiries; the wide and prompt distribution of these publications among the mining men of the country; and cooperation of impartial Government experts in this educational work by public addresses in mining camps and at the meetings of men associated with mining and quarrying industries—with a view to the prevention of accidents, the preventing of waste, and more efficient work.

"3. The above action is recommended with a view to the establishment from time to time of other allied bureaus and ultimately the establishment of a Department of Mines if the conditions may warrant such action.

"4. By revising existing legislation relative to mineral lands and mining:

"(*a*) To provide for the separation of surface from under-ground ownership, with a view to the independent development of the mining and of the agricultural or forest industries;

"(*b*) To prevent fraud in the entry and patenting of mineral lands; and

"(*c*) To facilitate the disposition of these lands by lease, sale, or otherwise, under such conditions as will best facilitate legitimate and practical mining."

President Richards announced that when these were presented to Secretary of the Interior Garfield, he said: "I think you are entitled to a Bureau," and President Roosevelt promised a definite recommendation in his next annual report.

At the session of 1907, George Otis Smith, director of the United States Geological Survey, presented an important paper on "The Possibilities and Limitations of Geological Survey Work as Applied to the Mining Industry," and Edward Goodrich Acheson, the discoverer of a method for the manufacture of carborundum, discussed some of his remarkable experimental work in the production of crucibles from artificial graphites. At this session, too, the work of all the mining schools of the country was thoroughly gone into, and the first steps were taken to secure government aid for experimental work in mining States.

In 1908, the American Mining Congress invaded the East, holding a session in Pittsburgh from December 2 to 5. And here the inspired prediction of Dr. Holmes became an historical fact. For the coal men not alone participated in the proceedings, but joined their problems and their energies to what, while national in scope, had up to this time been a purely Western organization. At Pittsburgh the American Mining Congress, in its membership, and in its activities, put on the purple toga of nation-wide cooperation.

At the Pittsburgh convention the American Mining Congress definitely planned what up to this time had been but a tentative program for the most stringent possible "safety" legislation.

The fact brought out that, in 1907, 3,000 miners were killed in accidents, an increase of 50 per cent over the record of 1906, brought home to the convention the need of the most drastic action.

Congressman J. F. Burke, of Pennsylvania, and Congressman John C. Chaney, of Indiana, and Senator Charles Dick, of Ohio, took an active part in the proceedings at Pittsburgh, and were the sponsors for the measures which were later drafted into law, and which had been brought up and discussed at the meeting of the American Mining Congress at Pittsburgh.

It is appropriate at this point to add that the impetus given for the enactment of "Safety" measures at the Pittsburgh convention was far-reaching in its influence. Here is a record that speaks for itself.

Year	Production (short tons)	Employed	Killed	Rate per 1,000 empl.	Killed per million tons
1907	480,363,424	680,492	3,242	4.81	6.78
1908	415,842,698	690,438	2,445	3.60	5.97
1909	460,814,616	666,552	2,642	3.96	5.73
1910	501,596,378	725,030	2,821	3.89	5.62
1911	496,371,126	728,348	2,656	3.65	5.35
1912	534,466,580	722,662	2,419	3.35	4.53
1913	570,048,125	747,644	2,785	3.73	4.89
1914	513,525,477	763,185	2,454	3.22	4.78
1915	[1] 518,000,000	[1] 767,553 [2]	2,264	2.95	4.37

[1] (Estimated by U. S. Geological Survey.)

[2] (Subject to change.)

OFFICE ASSIGNED TO THE USE OF PAUL WOOTON, NEWS EDITOR, THE MINING CONGRESS JOURNAL.

Meantime, acting on the humanitarian impulse created by this movement, many large industrial and railroad organizations have created special "Safety First" movements, through which marvellous results are being obtained in the way of preventing accidents.

It is interesting in this connection to note that one of the sessions of the American Mining Congress was held at the Government Station for investigation of mine explosions, which on that day, December 3, 1908, was formally opened, Hon. James R. Garfield, Secretary of the Interior, delivering the dedicatory address.

The proceedings of the Congress at Pittsburgh commanded world-wide attention. Among the notable papers read were the following: "Relation of the Federal Government to Mining," by Senator Charles Dick, of Ohio; "Transportation of Mineral Products," by Edward H. Harriman; "The Importance of Arbitration as a Factor in the Advancement of the Mining Industry," by Carroll D. Wright; "The Federal Government in Its Relation to the Mining Industry," by Secretary of the Interior, James R. Garfield; "Problems of the Coal Mining Industry," by Dr. J. A. Holmes; "Conservation in the Coal Industry," by John Mitchell; "Arbitration as a Factor in the Mining Industry," by Judge George Gray, of Delaware, and Thomas H. Lewis, President of the United Mine Workers of America, and "Distribution of the Nation's Mineral Wealth," by George Otis Smith, Director of the U. S. Geological Survey.

The twelfth annual session of the American Mining Congress was held at Goldfield, from September 27 to October 2, 1909, Judge J. H. Richards presiding. At this meeting Secretary Callbreath announced the first great advance in the movement to establish a Bureau of Mines: "During the Sixtieth Congress," he reported, "a bill was introduced in the Lower House for the creation of a Bureau of Mines, and passed by that body by a vote of 229 to 21. The bill was approved by the Senate Committee, but was talked to death in the final hours of the session. We will have to begin our work all over again."

And the Congress went on record again with a determination to win out at the next session.

Among the notable addresses at the Goldfield gathering, were the following: "National Problems," by Hon. Francis G. Newlands, of Nevada; "Silver and the National Government," by Judge C. C. Goodwin, of Salt Lake City; "Inspection of Mines," by Dr. J. A. Holmes; "The Mining Man's Interest in Land Classification," by George Otis Smith.

Dr. E. R. Buckley, of Rolla, Mo., head of the Missouri School of Mines, took the presidency at the thirteenth annual session which was held at Los Angeles from September 26 to October 1, 1910. And at this Congress, Dr. J. A. Holmes delivered his first public address as head of the newly created Bureau of Mines.

But the creation of the Bureau of Mines was a task that had its ramifications, and the Congress at Los Angeles lost no time in formulating by resolution much of the work it expected the new bureau to accomplish.

This covered a wide latitude from effective "Safety" measures for both coal and metal mines to a most comprehensive exploitation of the underground resources of the United States. It meant, moreover, that the Congress must put its shoulder to the wheel and urge the largest possible appropriation for effective work.

It was at this session of the Congress that the movement for a thorough revision of the mining laws of the country, was given a decided step forward.

But the most important report submitted was that of the Committee on Prevention of Mine Accidents. Its recommendations became of international interest and have since been incorporated into the statutes of many of the mining States of the country. The committee consisted of Walter R. Ingalls, chairman, J. Parke Channing, James Douglas, James R. Findlay and John Hays Hammond. It was first appointed by the American Mining Congress in 1906, reported progress in 1907 and 1908, and in 1909 was given permission to submit its report to the American Institute of Mining Engineers and to the Mining and Metallurgical Society of America as well as to the American Mining Congress.

This committee collated the mining laws of all the States and of foreign countries, and from a study of these compiled the now famous model statute "Relating to metalliferous mines and to provide for the health and safety of persons employed in and about the same." It gathered all available statistics on fatal mine accidents, and clearly established what had, up to this time, been only suspected, namely, that the loss of life in metal mining in the United States is fully as great as in coal mining. One of its most important recommendations, and which resulted in greater State appropriations through the West, was the concluding paragraph in its report on mine inspection.

"In the opinion of the committee, the essential steps toward reducing the loss of life in metalliferous mining are, "(1) a comprehensive and effective law; and (2) an adequate system of mine inspection. The latter is the keystone of progress. Much can be accomplished by an adequate system of mine inspection, even if a comprehensive law be lacking, but no matter how thorough and effective in theory a law may be, it will fail in its purpose unless provision be made for its sincere, impartial and positive enforcement by an adequate system of competent mine inspection.

"To secure such a system of mine inspection, the States must appropriate a good deal more money than any has yet done. Each State must have a mine inspector, and he must be provided with a sufficient number of deputies to enable frequent inspections of all operating mines to be made. One inspection of a mine in a year is not enough. The inspector and deputies must, moreover, be provided with proper funds for clerical work, traveling expenses, etc. So far as we are aware, the State of Colorado makes the largest appropriation for inspection of metal mines, its appropriation being $25,000 per year. Other important mining States appropriate only $10,000 per year. In the opinion of the committee, such appropriations are utterly inadequate. For States possessing a mining industry of the importance of that in Colorado, Utah, Montana, Nevada, California, and, in fact, all of the States and Territories west of the Rocky Mountains, an annual appropriation of $50,000 to $100,000 per State is necessary. Such expenditures are thoroughly justified by the importance of the end to be gained."

At this session of the Congress another important report was that of the Committee on "Standardization of Electrical Equipment in Coal Mines." The proposed code of rules presented at this time, and as revised at the following sessions, have since been incorporated in the statutes of many of the States of the Union.

Among the notable addresses at this session were the following: "The Bureau of Mines and Its Work," by Dr. J. A. Holmes; "Proposed Legislation for the Disposition of the Public Lands," by Hon. Richard A. Ballinger; "Shall We Have Private Ownership or a Leasing System," by Hon. F. W. Mondell; "Conservation as It Affects the Oil Industry," by Hon. Gifford Pinchot.

The fourteenth annual session was held in Chicago, from October 24 to October 28, 1911, Hon. John Dern, of Salt Lake City, presiding. The event of greatest import was the presence at this session of Hon. William H. Taft, President of the United States, who spoke on the topic, "The Government and the Mining Industry." M. Jean de Pulligny, director of the French Mission of Engineers to the United States, was another notable guest whose address to the convention covered conditions of mining abroad. England and Canada also had prominent representatives in attendance who participated in the discussions.

The subject of workmen's compensation laws was ably discussed, the report of the committee on that topic furnishing the basis for most important legislation.

At this session steps were taken to establish headquarters in Washington, and the by-laws were amended to permit of an extension of the work by admitting to membership coal mining organizations or kindred bodies. These changes have been of great import in the history of the American Mining Congress. By establishing its headquarters in Washington, the Congress was able to keep in close touch with Federal legislation on all mining subjects; to suggest measures approved by the conventions and to oppose whatever might be deemed injurious to the industry.

Among the notable addresses at this convention in addition to those already mentioned were the following: "The Public Land Question," by Gov. William Spry, of Utah; "The Past, Present and Future of Copper," by Horace J. Stevens, of Houghton, Mich.; "The Economics of the Coal Industry," by Carl Scholz, of Chicago; "What the West Needs in Coal Land Legislation," by Dr. George Otis Smith, of Washington; "Alaskan Problems," by Hon. Walter L. Fisher, Secretary of the Interior, and "The Relation of Congress to the Mining Industry," by Dr. Martin D. Foster, Chairman

OFFICE ASSIGNED TO THE USE OF MRS. E. RUSSELL COOMBES, SECRETARY TO MR. CALLBREATH

of the House Committee on Mines and Mining.

The fifteenth annual convention of the American Mining Congress was held at Spokane, Wash., from November 25 to 29, 1912, Samuel A. Taylor, of Pittsburgh, presiding.

The detailed report of the Committee on Standardization of Electrical Equipment in Metal Mines was submitted at this session, and is today considered an authoritative document in the compilation of legislation on this subject.

Among the notable addresses at this session of the American Mining Congress were the following: "The National Forests and Development of Natural Resources," by Henry S. Graves, United States Forester; "The Washington Compensation Act," by John H. Wallace, of Olympia, Wash., and "The Leasing of Mineral Lands," by William Griffith, of Scranton, Pa.

In 1913, the American Mining Congress held its sixteenth annual session at Philadelphia from October 20 to 24, David W. Brunton, of Colorado, presiding. The question of a revision of the mining laws of the country which had been agitated during successive Congresses, was now taking more definite shape. The cooperation of the American Institute of Mining Engineers, and of the Mining Metallurgical Society of America, was announced, and it was hoped that the three bodies acting together would obtain the long sought for legislative reforms in Congress.

Among the notable addresses at the Philadelphia convention were the following: "Relation of Big Business to Industrial Prosperity, with Special Reference to Mining," by Dr. Charles A. Van Hise, President of the University of Wisconsin; "Conservation from the Western Standpoint," by Senator John F. Shafroth, of Colorado; "Needed Changes in Our Mineral Land Laws," by Senator Thomas J. Walsh, of Montana; "Arbitration as a Factor in the Mining Industry," by Wm. B. Wilson, Secretary of Labor; "The Public Land Laws," by Assistant Secretary of the Interior, A. A. Jones; "Our Radium Resources," by Charles L. Parsons, Chief of the Division of Mineral Technology, Bureau of Mines; "The Federal Government and the Mining Industry," by Hon. M. D. Foster, Chairman of the House Committee of Mines and Mining, "Lessons of the Year in our Mining Industry," by Dr. Joseph A. Holmes, Director of the U. S. Bureau of Mines.

The seventeenth annual session, at Phoenix, Ariz., held from December 7 to 11, was presided over by Carl Scholz, of Chicago, and was marked by the last appearance at its session of the late Dr. Joseph A. Holmes, Director of the U. S. Bureau of Mines.

His remarks, brief as they were, had all the brilliancy of the past. He had traveled a long distance to be at these sessions which, to his far-seeing mind, formed the basis for all the success achieved in the establishment of the Bureau of Mines, and for whatever it could do in the future. Here, he felt, he was in touch with the mining men of the country, the working and the operating classes, the men who knew what was best for the industry. And so he came to speak when he was physically too weak to make such an effort. He had a message to deliver, but could not complete it, and, only when a friendly point of order was raised, did he consent to take his seat. But these last remarks before the American Mining Congress contain a message of work, of duty yet to be performed. "Since the Bureau of Mines was organized," said he, "there has been comparatively little increase in the moneys appropriated for the actual investigations of mining, consequently we have not been able to do the amount of work which we would like to have done. Our plans for the present year are in no way enlarged upon those of the past year. Now, that is a condition which is going to continue as it is now until the mining people of this country make up their minds to the fact that they are not being treated on the square. You realize this very interesting information brought out by the President in his address the other evening that, whereas every miner in this country contributes something like $1,800 a year to the national wealth, as compared to $800 or $900 contributed by every farmer of the country to the national wealth, at the same time the people of the United States contribute 28 to 30 cents per capita for the advancement of agriculture and less than 2 cents per capita to the advancement of mining; that in spite of the fact that mining is the most hazardous of our great industries, and agriculture is the safest; that in mining we have one lot of mineral resources and that when they are gone, the nation must depend upon something else or some other country, whereas agriculture is a self-perpetuating industry. Why is it, that it is so difficult to get anything done out of the Federal or State Treasury on behalf of mining? And the first reason which I found in talking with members of Congress is the fact that when you talk to them about helping mining, what they see is the Homestake and the Treadwell and the United Verde and half a dozen great, big mines in the country, and they say, 'Why, those fellows are rich enough to take care of themselves.' They don't see the small mines of the country; they don't see the struggling miners who are trying to build up a great industry, and the reason they don't see these things is because they are not presented to them; and in that connection I want to emphasize one of the most important lessons for this session of the Mining Congress to learn thoroughly, and that is that until the mining people of this country do what the railroad companies of the country are doing, educating public sentiment as to what the great industry is and what it means to this nation, the people of the United States will never understand it."

The letter from Hon. Woodrow Wilson, President of the United States, was in a way a keynote for the work of the Congress:

"It will always be a tribute to your foresight and energy," he wrote, "that this new Bureau of Mines in the short period of its existence, with the kindly cooperation of State and other agencies, has been able, by persistent and intelligent effort, to turn an isolated, local movement for greater safety into a great national movement for 'Safety First' that has already gone beyond the mining industry into every industry of the country. I venture to say that thousands of lives have been saved by that movement and that many thousands more will be saved in the future.

OFFICE IN WHICH THE STENOGRAPHICAL AND GENERAL CLERICAL WORK IS DONE

"Gratifying as the results of this life-saving campaign may have been, however, there is still vigorous work for your Congress to do. I am informed that during the last year, more than 3,000 men were killed and 100,000 injured in the mining and metallurgical industries of the country. . . . I suggest this situation as an opportunity for further endeavor on your part to cut down this excessive toll of death and injury."

At this session a decided advance was made in formulating the views of the country on mine taxation and on mine law revision and putting both these topics into statutory shape.

The first steps were also taken to establish, as an adjunct to the American Mining Congress, a Bureau of Mining Economics, which is to gather information covering every phase of practical mining, which is to keep in touch with markets, with production, with legal decisions, etc., etc. This movement is still under serious consideration and is making good headway.

At this convention it was determined to begin the publication of the MIN'NG CONGRESS JOURNAL, the first issue of which appeared in January, 1915.

The eighteenth annual convention was held in San Francisco, from September 20 to 22, President Carl Scholz, presiding. The notable event of the gathering was the Holmes Memorial Service, at which a vast host of admirers and friends paid tributes to the work and character of the late Director of the U. S. Bureau of Mines. All of the great problems which had come before the American Mining Congress in past sessions and still needed settlement were carefully discussed and prepared for presentation to State and national legislative bodies. Among the notable addresses at this convention was that by the successor of Dr. Holmes as Director of the Bureau of Mines, Hon. Van H. Manning. His presentation of "What the Bureau of Mines, in the Department of the Interior, Is Doing and Hopes to Do for the Metalliferous Mining Industry," was masterful and comprehensive.

Other notable addresses at this session were the following: "Plain Writing," by Dr. George Otis Smith; "Prejudice against Regulation," by Rush C. Butler; "California's Water Infiltration Law," by Fletcher Hamilton; "Federal Control of Water Power," by Hon. J. H. Richards; "The Need of Better Mining Education," by Charles F. Willis; "The Development of Mine Taxation in Arizona," by G. H. Dowell; "Workmen's Compensation Insurance and the Coal Mining Industry," by Herbert M. Wilson; "The New Plan of Mining Insurance," by David Ross; "Mining Hazards on the Pacific Coast," by Dr. Frederick L. Hoffman, and "Future of the American Zinc Industry," by Otto Ruhl.

This history of the American Mining Congress is compiled largely from the records of the conventions held from year to year, and to a great extent, and necessarily, bridges over an immense amount of labor done by officials and committees between sessions. But it would not be a history in any sense if it did not include as far as this is possible, some mention of what one must call the more intimate work of the Congress.

When James F. Callbreath was elected

ENTRANCE TO THE AMERICAN MINING CONGRESS' SUITE OF OFFICES.

secretary, in 1904, at the Portland convention, the Congress felt that its influence must not begin and end with annual discussions and resolutions. Here were the expressions, the sentiments, here was the consensus of opinion of the mining men of the country. It was imperative that these recommendations should be shaped into laws, both State and national, and to Mr. Callbreath, as secretary, was given the task of driving home, so to speak, the determinations of the Congress. How well the task was done, how brilliantly and conscientiously the purposes of the Mining Congress were brought to the attention of the law makers of the land, is best attested by the results. The task was, in many respects, herculean, for there were vast interests opposing every progressive movement of the Congress. And it was sheer grit, and a gripping persistence on the part of the officials of the Congress and the men who worked with them in the intervals between conventions that wrested from legislators, State and national, important reforms that have bettered the working conditions in the mines, have saved the lives of thousands of workmen, changes that have made mining investment safe and stable, new laws that have uplifted the mining industry of the country.

And the work of preparing for the conventions, of mapping out programs, of securing speakers of note, of interesting a greater number of mining men in the cooperative work of the Congress, all the vast details of preliminary work, has been done by Mr. Callbreath with rare zeal and intelligence, and is reflected in a constantly growing organization and in more and more interesting and instructive conventions.

In 1913, Carl Scholz, of Chicago, was elected President of the American Mining Congress. He was reelected at both the following conventions, and without reflecting on the many capable executives of the past, it is but just to him to say, that no one has had the welfare of the Congress more at heart, no one has ever served it with a greater zeal for the advance of the mining interests in America. No task in behalf of the industry proved too arduous for him to undertake, and no executive has ever carried out with greater skill and with more success the determinations of the Congress.

OFFICES ARE REPRESENTATIVE

American Mining Congress Housed in a Manner Compatible with the Dignity of a Great National Industry.

Offices in Washington are maintained by the American Mining Congress on a scale compatible with the dignity of an organization representing the great mining industry of the nation. These offices are in the new Munsey Building, which is one of the beautiful edifices gracing the busiest section of Pennsylvania Avenue.

The American Mining Congress occupies offices Nos. 743, 744, 745 and 746. These offices are en suite, and are in that portion of the edifice adjoining the Geological Survey Building.

Accompanying this article are cuts showing the interior views of the five spacious rooms occupied by the Mining Congress.

When any one interested in mining is in Washington he is invited to make the Mining Congress offices his headquarters.

ARIZONA BEGAN PRODUCING COPPER STEADILY IN 1875

The steady output of copper from Arizona began in 1875. There was an intermittent production, however, prior to that date. A record of production exists as early as 1862, says B. S. Butler, of the U. S. Geological Survey.

Since 1880 the growth of the copper mining industry in Arizona has been steady and rapid. At the close of 1915 Arizona had recorded a production of 5,072,851,628 pounds of copper or 24 per cent of the total output of the country. It ranks third among the States in total production.

WASHINGTON COAL MARKETS BEING SUPPLIED FROM CANADA

The removal of the duty on coal has allowed increasing quantities of Canadian coal to enter the Washington markets, coal from Vancouver Island now being used extensively in the Puget Sound cities and British Columbian coal from the Crow's Nest district entering the Spokane district according to the U. S. Geological Survey. The bunker trade has fallen off since the war began, and the number of vessels entering the Sound ports has decreased. This is offset to some extent by vessels having westbound cargoes above normal now taking on fuel coal in Washington (or Vancouver, British Columbia) ports rather than carrying sufficient Japanese coal for the round trip. A material betterment in the lumber market, the principal industry of the Northwest, will, of course, benefit the coal producers.

SHOOTING FROM THE SOLID FORBIDDEN IN SOME STATES

Opposition to shooting from the solid has developed, because it is injurious to the mining property in that the unusual charges of powder weaken the roof and pillars, which increases the liability to falls of roof and coal, the most prolific cause of fatal accidents to coal miners. Another objection to this method is that the heavy charges of powder required to blow down the coal where it has not been previously undercut or sheared, result in the production of a much higher proportion of fine coal and render the lump coal so friable that it disintegrates in handling and in transportation. With the growing use of mechanical stokers and of powdered coal, the latter objection is losing much of its force, but the danger attending the method has been in no wise diminished, and it is forbidden by law in some of the coal mining States.

EDW. N. HURLEY

Chairman, Federal Trade Commission, who will speak on "The Federal Trade Commission and the Mining Industry."

NUMEROUS SMELTING PLANTS ARE TREATING COPPER

Smelting plants which treated copper in the United States during 1915 are as follows: Arizona Copper Co., Clifton, Ariz.; Shannon Copper Co., Clifton, Ariz.; Calumet & Arizona Mining Co., Douglas, Ariz.; Copper Queen Consolidated Mining Co., Douglas, Ariz.; Old Dominion Copper Mining & Smelting Co., Globe, Ariz.; American Smelting & Refining Co., Hayden, Ariz.; Consolidated Arizona Smelting Co., Humboldt, Ariz.; United Verde Copper Co., Jerome, Ariz.; International Smelting & Refining Co., Miami, Ariz.; Detroit Copper Mining Co., Morenci, Ariz.; Penn Mining Co., Campo Seco, Cal.; Mammoth Copper Mining Co., Kennett, Cal.; Mountain Copper Co., Martinez, Cal.; Wanakah Mining Co., Ouray, Colo.; Ohio & Colorado Smelting & Refining Co., Salida, Colo.; Baltimore Copper Smelting & Rolling Co., Baltimore, Md.; Lake Superior Smelting Co., Hancock, Mich.; Quincy Mining Co., Hancock, Mich.; Michigan Smelting Co., Houghton, Mich.; Calumet & Hecla Mining Co., Hubbell, Mich.; Missouri Copper Mountain Mining Co., Sullivan, Mo.; Anaconda Copper Mining Co., Anaconda, Mont.; East Butte Copper Mining Co., Butte, Mont.; Anaconda Copper Mining Co., Great Falls, Mont.; American Smelting & Refining Co., Omaha, Nebr.; Nevada Consolidated Copper Co., McGill, Nev.; United States Metals Refining Co., Chrome N. J.; American Smelting & Refining Co., Maurer, N. J.; Balbach Smelting & Refining Co., Newark, N. J.; Raritan Copper Works, Perth Amboy, N. J.; Santa Fe Gold & Copper Mining Co., San Pedro, N. Mex.; Nichols Copper Co., Laurel Hill, N. Y.; Tennessee Copper Co., Copperhill, Tenn.; Ducktown Sulphur, Copper & Iron Co. (Ltd.), Isabella, Tenn.; American Smelting & Refining Co., El Paso, Tex.; Garfield Smelting Co., Garfield, Utah; International Smelting & Refining Co., International, Utah; Norfolk Smelting Co., West Norfolk, Va.; Tacoma Smelting Co., Tacoma, Wash.

ANTHRACITE COAL USED IN COMPARATIVELY LIMITED AREA

"Anthracite is shipped to nearly every State in the Union and to many foreign countries. The major portion is consumed in the territory near Pennsylvania, including Canada. In the larger eastern cities its use has become a necessity, but farther west and south anthracite is more of a luxury than a necessity, and in the States most remote from the East the quantity consumed is small," says C. E. Lesher, of the Geological Survey.

"The output of the anthracite mines is carefully crushed, cleaned, and divided into sizes by a process and at a cost that render it little less than a manufactured product. There are ten of these sizes, each with its price and special use. Two major divisions are recognized, however—the prepared or domestic sizes, including broken, egg, stove, and chestnut, which range from 4 inches down to three-fourths of an inch, and the steam coal, including pea, buckwheat, buckwheat No. 2 (rice), and buckwheat No. 3 (barley), which range from three-fourths to one-sixteenth of an inch. The domestic sizes are in greatest demand and consequently bring the highest prices. Attention in preparation is therefore directed to obtaining the largest possible proportion of those sizes, and the finer coal resulting from the crushing is a by-product. It is not possible, however, to increase the proportion of domestic sizes beyond 60 to 65 per cent of the coal shipped, or 50 to 55 per cent of the total product."

CLEMENTS IN TEMPORARY CHARGE OF MINING TECHNOLOGY

Dr. J. K. Clements has taken charge of the division of mineral technology at the Bureau of Mines during the absence of Dr. Chas. L. Parsons. In order to take over this work it was necessary for Director Manning to secure a furlough for Dr. Clements from the Pennsylvania National Guard. Dr. Clements is a major in this organization and has been doing duty on the border.

SYSTEM REPLACES CHAOS AT MINE DISASTERS UNDER BUREAU OF MINES PLAN

Inexpensive Organization among Employes of Mine Provides for All Contingencies That May Arise in Case of Accident—Plan Discussed in Bulletin Now Being Distributed

The manner in which the Bureau of Mines is turning chaos into systematic rescue work is shown in the publication of "Rescue and Recovery Operations in Mines after Fires and Explosions." The authors of this bulletin are James W. Paul and H. M. Wolflin. An unusually large number of this bulletin will be distributed.

Following disasters in mines the history of such catastrophes is that much confusion and lack of systematic efforts at rescue work result. Essential equipment often is lacking. At times foremen are cut off in the mine and no one is at hand to take charge of the rescue operations. This bulletin urges systematic preparation for possible accidents. It is published in the new pocket size, which form is to be adopted in the publication of a number of Bureau publications, which it is desired to have conveniently in hand in case of accidents.

Van H. Manning, Director of the Bureau, in his preface to this bulletin says:

In the course of the work being done by the Bureau of Mines to increase health, safety and efficiency in the mineral industries there is need of close and intimate association and cooperation with other agenies working for the same end. The bureau gladly acknowledges the work done by the States, by technical societies and local institutions, chambers of commerce, miners' organizations, opertors and many other agencies, and seeks to make use of their results in planning its own investigations.

The Federal Constitution recognizes certain functions of the States which are commonly known as State rights. The Bureau of Mines does not attempt to usurp any of these functions, but seeks to cooperate with the States in investigations that will benefit a State and the Federal Government. Because the Government through its greater resources is able to carry on more extensive and longer investigations, it is generally better able to command the services of specially trained men, and the State receives a benefit through cooperation that it could not obtain otherwise.

Without the aid of the operator who has developed the mines, the bureau could accomplish little in an effort to be of service to the mining industry. Aided by the kindly cooperative spirit of mine owners and operators, the bureau can prosecute its work. Investigations conducted within mines by the engineers of the bureau have a scientific and practical value that in time will innure to the benefit of both operators and miners, as well as to State mine inspectors.

At times of explosions and other disasters the engineers of the bureau come in intimate contact with the inspectors, who, in all instances, have extended the courtesies of their State.

On many occasions when rescue men of the Bureau of Mines have reached mines in which miners have been imprisoned by explosions or fires, the inspectors have availed themselves of the services of the trained men by consulting as to methods of procedure and the advisability of permitting explorations in advance of the fresh air by crews wearing breathing apparatus. In a number of instances the inspector himself has donned apparatus and directed the rescue crews.

In the work of the bureau's rescue crews full cooperation with the inspector or inspectors is of prime importance, as in most instances the management of the mine turns over to the inspector the direction of the work incident to rescuing entombed men and to recovering the dead and injured.

THE MINER

So much is dependent on the miner, whose work and acts control his own safety, that the bureau has taken every opportunity to cooperate with him and to receive his assistance and advice. Miners have been especially unselfish and helpful, not only to the bureau, but to the mine owner, in assisting in mine recovery and rescue operations; they have gladly volunteered to receive training in the modern methods of rescue and first-aid work, and now compose the growing army of trained men ready to offer aid at time of need.

A large part of the work of the bureau deals purely with investigations of the causes and the prevention of accidents, and seeks to increase safety and health in the mining industry. Investigations are conducted in a mine after an explosion or fire in order to obtain information of scientific value for conducting experiments that will show the cause of the explosion, fire or other accident, and will develop methods of prevention.

The Bureau of Mines, with much care and at much expense, has collected information in the United States and in Europe on mining methods and the prevention of accidents. Having thus a store of knowledge on many subjects of vital importance to the mining industry and to the safety of the mine workers, as well as the knowledge gained through experiments in laboratories and mines, the bureau endeavors to impart the information to the miner, the operator and all others concerned in mining. For this reason the bureau is conducting an educational campaign in all the mining centers of the country by means of public lectures illustrated with lantern slides and moving pictures, by teaching first aid to the injured, by training miners in the use of rescue breathing apparatus, and by lectures on rescue and recovery methods. All of this instruction is furnished without cost to the miner.

POLICE POWER

The Bureau of Mines has no authority of law to enter any private mine or to require any operator or miner to observe any law or regulation. As the mines are the property of the mine owners, members of the bureau gain admittance to any mine only through the invitation or the permission of the owner or the officials of a mine. Through this freedom of entry extended by the operators the bureau has obtained much valuable scientific information. This information has been carefully guarded to prevent its being used in such a way as would antagonize mine owners and lead to free entry to their mines being denied the bureau's engineers. The bureau's adherence to this practice, in compliance with regulations of the Interior Department, has been the occasion of some misunderstanding when engineers of the bureau have been subpœnaed to testify before coroners' juries, who under State laws are required to place the blame for criminal acts or for negligence.

The bureau has no authority to enforce any of its recommendations, still less to enforce any provision of State laws. At the best, it can only recommend and leave the operator and the miner free to adopt or to reject. The recommendations of the bureau to the general mining public are printed in the publications issued by the bureau. After an investigation of a mine disaster a report is prepared for the benefit of those engineers of the bureau who are engaged in studying methods of accident prevention. The report contains the conclusions and recommendations of the engineer who conducted the investigation in the mine. At the request of the operator a copy of the report is furnished for his confidential information. As a rule, the operator has endeavored to adopt the recommendations in the subsequent operation of the mine.

The Bureau of Mines intends to publish, from time to time, combined reports in which, without the mines being named, the results of inquiries regarding causes and effects of different features of disasters will be stated for the benefit of students of mine methods, and primarily to point out ways in which disasters may be prevented.

POLICY IN COOPERATIVE WORK

The bureau aims to extend its educational work, to train a large number of miners in the use of rescue breathing apparatus, to induce operators to establish rescue stations provided with breathing apparatus, and to keep crews of men trained to use the apparatus immediately when life may be saved. When a disaster imprisons miners, the nearest trained rescue men and rescue car or truck of the bureau is dispatched to render all possible assistance to those in charge of the rescue and recovery operations. The bureau's men have no authority to assume charge of any of the work, and do so only at the request of the mine officials. On arrival at the mine, the bureau's men confer with the official in charge and the State Mine Inspector, and tender any assistance that may be of use in rescuing imprisoned men. In the conduct of rescue operations the bureau's men exercise their best judgment in the part they may take; they observe the regulations for their own safety and the safety of others who may be working under their direction.

To facilitate the work of rescue and recovery the officials of the mine should summon twenty or more trained rescue men to work in cooperation with the bureau's men, as rescue operations require thorough organization. To be effective, the crews must work systematically and keep in good physical condition, observing the rules for periods of work and rest. Thus, if the rescue work is to be continued, the need of having on hand at least twenty trained men is evident.

The Bureau of Mines maintains only one trained rescue man at each of its several stations, and not over three on any one of its cars, and such a small force can not conduct rescue or recovery work without assistance. The Bureau is not able financially to keep in its employ at each station and on each car enough trained men to make a properly constituted rescue crew, therefore in order to accomplish rescue work the services of trained miners must be obtained. To procure this additional assistance involves expenditure for transportation, subsistence and wages during the time the miners are absent from their regular work, and this expenditure the operator of the mine in which an explosion or fire occurs is expected to meet. In all the principal coal and metal mining districts enough miners and mine employes have now been trained to permit the quick assembling of a large number of men trained to assist in mine recovery work.

Where such arrangements are made possible the bureau will furnish rescue apparatus from its nearest station or car, and the trained engineers and miners of the bureau will be on hand as soon as they can be to direct or advise and assist in conducting in the safest manner the exploration of the mine for recovering entombed miners and for locating any fires. The bureau's men will work under the direction of the official in charge, or of the State Inspector, but will take only such responsibility as pertains to safe methods and the work of the rescue crews wearing breathing apparatus.

Evidently mine operators should provide local rescue stations at individual mines or a joint station for a group of mines, and equip the station with rescue apparatus ready for immediate use, so that they need not depend on the bureau's apparatus, which may have to be transported many miles, and not reach the scene of the disaster until after many hours or the greater part of a day.

LABOR REPRESENTS MORE THAN HALF OF COAL'S PRICE

Labor is the item of largest importance in the business of producing coal. It is generally considered that the mining rate—that is, the contract price paid the miner for loading out the coal—is about one-half the cost of the coal on board the railroad cars, or one-half the mining cost. When to the miner's compensation is added the cost of the day labor in and about the mines, it is seen that considerably more than one-half the total cost of a ton of coal is due to labor.

The average daily output per employe varies in different districts and is determined by a number of factors, among the most important of which are thickness of coal bed, use of mining machines, efficiency of labor, and particularly efficiency of management. The average daily output has exhibited a steady upward tendency and in the period from 1900 to 1915 has declined but four times—in 1901, in 1903, an abnormal year in coal mining because of the anthracite strike in 1902, and in 1907 and 1913, both record years for the coal industry as regards quantity of output. Undoubtedly this improvement is due to better methods of mining, involving not only the greater use of cutting machines but also improved haulage systems and other mechanical and engineering features. When the demand for coal is slack and prices fall off, there is incentive to conserve labor; but when every effort is directed toward increasing output to meet strong demand at rising prices, efficiency is allowed to slacken. Such conditions account for the decline in the quantity of daily output per employe in 1907 and 1913.

The average annual output per employe depends upon the daily rate and the number of active days. The best efforts of all concerned cannot greatly affect the daily rate within any short period, and record outputs are therefore obtained by increasing the number of men and by working the mines a greater number of days. The total number of men engaged in mining bituminous coal has, with a few slight exceptions, shown increase in each succeeding year from 1900 to 1914, and the average number of days the men worked has varied up or down with the increase or decrease in the total production.

The record for 1915 presents a striking exception to the general tendency, for although there was (compared with 1914) an increase in total output, accompanied by a greater number of active days, the number of employes decreased notably. When considered in connection with the statistics of previous years, this decrease is seen to be abnormal and indicates at least the beginning of a shortage in labor, substantiating the views of those in the industry that such a shortage was imminent during the closing months of 1915 and was not seriously felt only because of the halt in production caused by the shortage in cars.

With the increase of wages that were made in April, 1916, and the opportunity for more than the usual number of days' work, the coal miners are sharing very fully in the general prosperity of 1916.

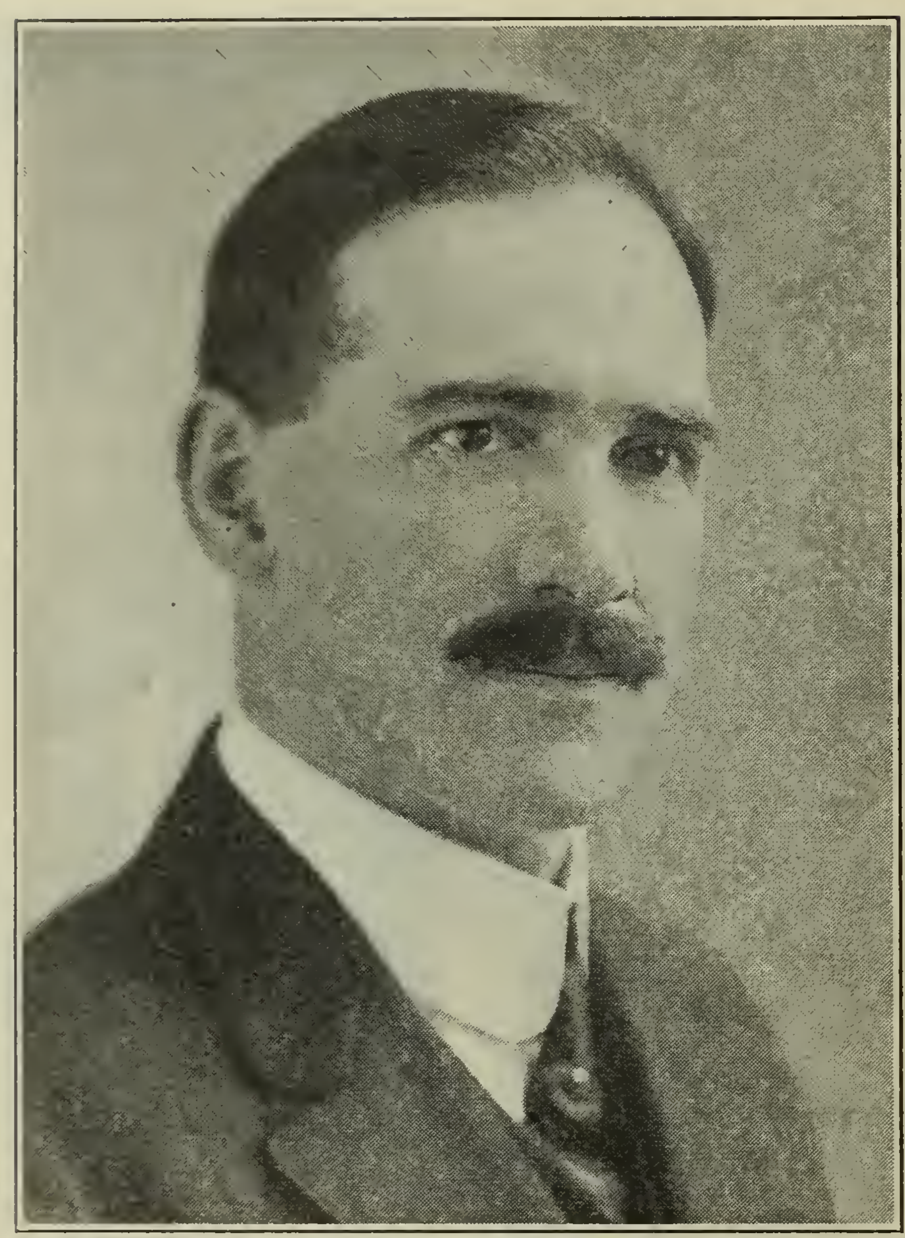
DR. W. R WHITNEY

Research expert of the General Electric Company, who will speak on "Necessity for Research Work in the United States."

BAIN EN ROUTE TO CHINA TO EXAMINE MINES

H. F. Bain, formerly editor of the Mining Magazine, of London, was in Washington recently. Mr. Bain is now engaged in professional work and is en route to China where he will make examinations of properties. He also expects to do some professional work in Siberia before returning to the United States.

W. C. Phalen, who recently joined the division of mining technology of the Bureau of Mines, has begun work on a special treatise on salt. Later he will have a similar report on manganese.



DR. F. G. COTTRELL
Chief Metallurgist, Bureau of Mines

IRON ORE TONNAGE THROUGH SAULT CANAL TAKES BIG JUMP

An increase of nearly 2,000,000 tons of iron ore passed through the Sault Ste. Marie Canal during September, a report to the Department of Commerce shows. There was also a healthy increase in the amount of copper shipped by the way of the canal. Pig iron shipments more than doubled. West bound coal increased markedly. This applies to both bituminous and anthracite.

During the six months ending with September, there was an increase of iron ore from 33,761,752 tons in 1915 to 47,370,350 tons in 1916. West bound bituminous coal for the six months ending September, 1916, was 11,030,178 tons as compared with 8,106,063 tons in 1915.

Firm Changes Name

G. L. Simonds & Co., of 230 South La Salle Street, Chicago, announces a change in name. In the future the company will be known as the Vulcan Fuel Economy Co.

The corporation simply adopts a new name. The personnel and policies of the organization remain the same. The only change, in addition to that of the name, is an increase in capital.

MORE THAN HALF BITUMINOUS COAL MINED BY MACHINES

The proportion of machine-mined bituminous coal to the total putput has increased each year. In 1915 the proportion was 55 per cent, twice that of 1903, twelve years before, and the number of tons so mined in 1915 was more than three times that in 1903. It is interesting to note that among the nine States ranking highest in order of bituminous production—that is, producing 8,000,000 tons or more—all but two, Alabama and Colorado, showed more than half mined by machines; and that among all the other States only two, Montana and Michigan, recorded like proportions.

FOSTER WANTS ACTION ON BILL AT SHORT SESSION OF CONGRESS

Efforts will be made by Dr. Martin D. Foster, chairman of the Committee on Mines and Mining, to get action on his bill, providing for the revision of the mining code, at the short session of Congress. All members of the Committee on Mines and Mining have been asked to meet in Washington ten days prior to the meeting of Congress so that consideration of the bill may be begun at that time.

H. E. WILLARD
Who will speak on "Coöperation."

MOVEMENTS OF COAL LAST MONTH EXCEEDED SHIPMENTS OF 1915

The following is a statement of carloads of bituminous coal and beehive coke that originated on forty-nine railroads in September, 1916, compiled from reports received by the Geological Survey, prior to noon, October 16.

Comparative figures are based on reports of 49 roads for September, 1916.

	Sept., 1916	Aug., 1916	Sept., 1915
Carloads of bituminous coal	441,256	455,453	437,267
Carloads of beehive coke (9 roads)..	54,661	51,834	46,976

September, 1916, showed an increase in shipments of bituminous coal of 0.9 per cent over September, 1915, and a decrease of 3 per cent from August, 1916. The increases in shipments of beehive coke for the same month were 16 per cent and 5 per cent, respectively.

The heavy movement in August is thought to be due to unusually large purchases when the railroad strike was threatened.

BUREAU OF MINES ENGINEER DIES IN AN EFFORT TO REACH ENTOMBED MEN

In an effort to reach entombed men in the mine of the Jamison Coal and Coke Company, at Barrackville, W. Va., Lewis M. Jones, one the Bureau of Mines mining engineers, was overcome and died before he could be removed from the mine.

Mr. Jones was born in Cleveland, Ohio, and took up his residence in Pittsburgh after he entered the employ of the Bureau of Mines, February 15, 1909. He was a graduate of the Columbia School of Mines, New York City, and was an honor man in his studies. He leaves a wife and one child.

"The death of Mr. Jones is a heavy blow to the Bureau of Mines," said Director Manning. "He was a mining engineer of exceptional ability and was perhaps the best man we had in directing rescue work at disasters. Under the chief mining engineer of the Bureau, Mr. Jones had charge of the experimental mine of the Bureau at Bruceton, Pa., a few miles outside of Pittsburgh, and in this capacity developed many safeguards that are not only saving life in the coal mines, today, but will be instrumental in the saving of thousands of lives in the future. It was at this mine that the coal operators of the United States received their first real impressions of the destructiveness of an explosion of coal dust without the presence of gas and were given demonstrations as to the methods to be pursued in preventing such disasters. As a result of Mr. Jones' efforts, there has been a great decrease in the number of dust explosions. The fact that the death record among the miners last year was the lowest in the last sixteen years emphasizes the worth of Mr. Jones' efforts in behalf of the miners.

"Mr. Jones had been an important factor in the development of more orderly and safer methods of rescue work. He dies a martyr to the cause, like three other rescuers of the Bureau have died.

"The roll of Bureau of Mines heroes who have given up their lives to save others now includes Joseph E. Evans, rescuer, killed at Throop, Pa., April 7, 1911; John Ferrell, killed at Cherry Valley mine, Cherry Valley, Pa., January 20, 1912; Edward Evans, killed at Rock Springs, Wyo., September 30, 1913; and Mr. Jones, killed this morning at Barrackville, W. Va."

Fuel Oil Hurts Texas Coal

Coal mined in Texas competes with fuel oil and natural gas and also with coal from Alabama and from New Mexico and Colorado, and the increased use of fuel oil and natural gas has had the effect of decreasing the demand for coal in that region.

IMPORTATIONS BLAMED FOR DROP IN THE PRICE OF ZINC

Continued activities are reported from the mining fields, except those producing zinc, the low price of which continues, says the October report of the Kansas City Bank to the Federal Reserve Board. A dependable authority claims that it is now established that the drop in prices is caused by importations, Australia sending 30,000 tons monthly and Mexico 15,000 tons monthly to the smelters. The greatest activity in this district is in the Miami field in Oklahoma. Joplin, the center of this mining district, has been undergoing a great building boom, indicating that the temporary mining slump has had little effect on commercial activity. The production in the Joplin district for the thirty-six weeks of 1916, ending September 10, had a total value of $23,881,158, whereas the value of the total production for the entire year, 1915, was but $26,038,650.

The Cripple Creek (Colo.) district shows a production for the month of August totaling 95,268 tons, with a bullion value of $1,294,342. The increase over July approximates 10,000 tons and $100,000 in valuation. Colorado mines during the first six months of this year gave employment to 15,000 men, an increase of 50 per cent over the number of men employed in the same period in 1915. Sixty-four mining companies in this State are said to have paid out in excess of $80,000,000, and this does not include all the mines in operation.

The recent increase of 6 cents in the price of silver means an average increase of about 15 per cent in net earnings of the average silver producer. Colorado marketed 1,505 tons of ore and concentrates of tungsten, valued at $3,648,000, the first six months of this year, according to figures very recently made public. The mining outlook in the Goldfield (Colo.) district is affording the utmost satisfaction to those interested in the development work in that district. Two flotation plants, with a combined capacity of 1,200 tons daily, are now in operation. This is a system of recovering ores by oil flotation, by which system deep-level ore can be treated at low cost and with a high extraction of the metallic contents.

Labor conditions are generally upon a satisfactory basis. Unsettled conditions have prevailed in the ranks of mine laborers, but most of the differences have been amicably settled through conferences. One such conference involved the action of 35,000 miners.

Production Fluctuates Slightly

Anthracite is a fuel of domestic use and does not enter into the industries like bituminous coal, and therefore does not respond, save in a general way, to the influences affecting trade. The rate of production is not subject to the variations that attend bituminous coal, but the average value shows much the same tendency noted with soft coal, although the range is much greater.

THEODORE F. VAN WAGONEN

Who will speak on "Extralateral Rights"

Phosphate Rock Output Decreases

The phosphate rock marketed in the United States in 1915 amounted to 1,835,667 long tons, valued at $5,413,449. Compared with the production of 1914, which was 2,734,043 long tons, valued at $9,608,041, this was a decrease of 898,376 long tons, or nearly 33 per cent, and in value of $4,194,592, or nearly 44 per cent.

Less Demand for Kansas Coal

In common with the other coal-producing States in the southwestern territory Kansas depends on the railroads as the principal market for its coal. The well-directed efforts of the railroad officials in effecting economy in the use of coal and the large use of oil as fuel have tended to curtail production of coal in the southwestern area during the last few years.

Delivers Geological Lectures

E. W. Shaw of the Geological Survey recently delivered several geological lectures at the University of Chicago. While in Illinois he paid a visit to the gravel and clay deposits of southern Illinois. He also visited oil and gas fields of eastern Kentucky where the Survey is beginning a general study.

MUCH CLASSIC COPPER GROUND INSPECTED BY MINING ENGINEERS IN ARIZONA

Trip Under the Auspices of the American Institute of Mining Engineers Reported to Have Been a Great Treat—With Mines Working at Capacity and Smelters in Full Blast Opportunities for Inspection Were Good

By Joel H. Watkins,
Geologist, Southern Railway Co.

The Arizona meeting of the American Institute of Mining Engineers has been voted by many, the most successful and enjoyable in the history of the institute. The committee on arrangements who enabled us to see so much classic copper ground in such a short time is certainly to be congratulated, and the committee on transportation is also due a vote of thanks for the excellent train service and dining-car service throughout the entire trip.

The train which left New York on September 14, with only one special Pullman, by the time it reached Bisbee on September 20, had fourteen special Pullmans—including two private cars. The greatest number of men on the train at one time is reported to have been about 210.

Mr. Carl Scholz, president, American Mining Congress, and manager, Mining and Fuel Department, Chicago, Rock Island and Pacific Railway Company, shortened the hours between Chicago and El Paso by distributing through the train maps showing the mineral resources of the Rock Island System and personally calling attention to points of interest visible from the train.

We arrived at El Paso about 3 o'clock on the afternoon of Sunday, the seventeenth, and were met at the train by a large reception committee who took us directly from the train in private autos through the military camps, where some 120,000 soldiers were under canvas, and then through the beautiful residence section of the city. Later in the afternoon we were conducted by Mr. Karl Eilers through the smelting plant of the American Smelting and Refining Company. In the evening we were entertained at the Toltec Club where we were given a typical Mexican dinner.

MENU

TORONJA
ENCHILADAS CON HUEVOS
TAMALES DE POLLO
TORTILLAS
FRIJOLES REFRITOS
NIEVE NAPOLITANA
QUEQUI
CAFE

The trip from El Paso to Santa Rita was made over night, and after breakfast at Santa Rita on the morning of the eighteenth, we were given a bird's-eye view of the enormous open cut workings of the Chino Copper Company from open-air cars over the company's mine tracks. After the open-air excursion, a part of the party made a closer inspection of the open cut workings and ore bodies of the Chino Copper Company, and others made the trip across country to the mine and mill of the Empire Zinc Company. An excellent barbecue dinner was served under canvas, and the company's garage was turned into an open bar where refreshments named for the distinguished members present were served free to everyone. After dinner the train was moved to Hurley and the afternoon was given up to an inspection of the Chino concentrating mill. In the evening a dance was given in a large open air pavilion in honor of the ladies attending the meeting.

Arriving at Douglas about 7 a. m., on the morning of the nineteenth, we inspected the reduction works of the Copper Queen Consolidated Mining Co., and in the afternoon the reduction works and acid chambers of the Calumet and Arizona Mining Company.

Late in the afternoon the first technical session was held. Subjects: Leaching and Smelting. Those who did not care to attend the technical session availed themselves of the opportunity of motoring into Mexico and viewing the recent battlegrounds and trenches around Agua Prieta. In the evening there was a dance at the Country Club in honor of the ladies.

At Bisbee, on the twentieth, the party was divided into two groups. Those most interested in mining methods took the underground trip at the Calumet and Arizona properties, and those most interested in geology took the underground trip at the Copper Queen mine in Sacramento Hill. Dinner was served at the Copper Queen Hotel, after which the second technical session was held. Subject: Mining and Geology.

In the evening there was a banquet given by the local members to the visiting members at the Warren Country Club.

At Globe we were camped for two days. Thursday, the twenty-first, we visited the mines and reduction works of the Old Dominion Copper Company, held the third technical session. Subject: "Concentration and Flotation."

On Friday, the twenty-second, we visited the mines and mills of the Miami and Inspiration Copper Companies, and the reduction works of the International Smelting and Refining Company. Luncheon was served at the Country Club, and late in the afternoon, the fourth and last technical session. Subject: "Mining and

Smelting." In the evening a banquet and dance were given by the local members.

On Saturday, the twenty-third, almost the entire party took the automobile trip over what is known as the Apache Trail, from Globe to Phoenix via the great Roosevelt dam. The entire distance is about 120 miles over most of which the scenery is very wonderful. After spending an hour or more about the dam, we passed along the government road down the gorge below the dam to Fish Springs where we had dinner. One of the most impressive features of the day was passing suddenly from a flat desert country east of Phoenix, into the beautiful green irrigated country around Phoenix. We were some 7 or 8 hours late reaching Grand Canyon on Sunday, the twenty-fourth, so the party voted unamimously to stay over until Monday night. On Monday a large party made the trip down to the bottom of the Grand Canyon via the Bright Angel Trail, while others visited different points of interest along the rim. From this point the party was practically disbanded as all that remained was the journey homeward.

To the members of the Institute the trip afforded a most unprecedented opportunity to study copper mining and smelting methods under the best conditions as all of the copper mines and smelters are now running at full capacity. Both the mining and smelting companies certainly tried to out-do themselves in throwing open the doors and offering every possible facility for the members to study their practices in both mining, concentrating and smelting. The visiting members were divided into groups and personally guided through the different departments by superintendents, who explained in detail every phase of treating the ore from the time it is broken in the stopes until the metal itself is cast in moulds. Although the attendance was considered good, it certainly seems to me that a larger number of members would avail themselves of this splendid opportunity to study, geology, mining and smelting—particularly the younger men. Among some of the more prominent men present at this meeting were: Dr. L. D. Rickets, president of the Institute; B. B. Thayer, past president; Bradley Stoughton, secretary; Geo. D. Barron, Philip N. Moore, J. S. Jennings, Walter Douglas, John C. Greenway, L. O. Howard, Karl Eilers, Carl Scholz, Arthur Natman, E. P. Matheson, C. W. Goodale, Forest Rutherford, and Julius Kruttschnitt, Jr.

Hoovers to Open New York Office

Theodore J. Hoover will open an office in New York in the near future to represent the various companies in which he and his brother, Herbert V. Hoover, of London, are interested.

GEORGE OTIS SMITH TO ADDRESS GEOLOGICAL SOCIETY OF AMERICA

George Otis Smith, Director of the Geological Survey, will present a paper on "Geology and Public Service" at the December meeting of the Geological Society of America. This meeting will be held at Albany, N. Y.

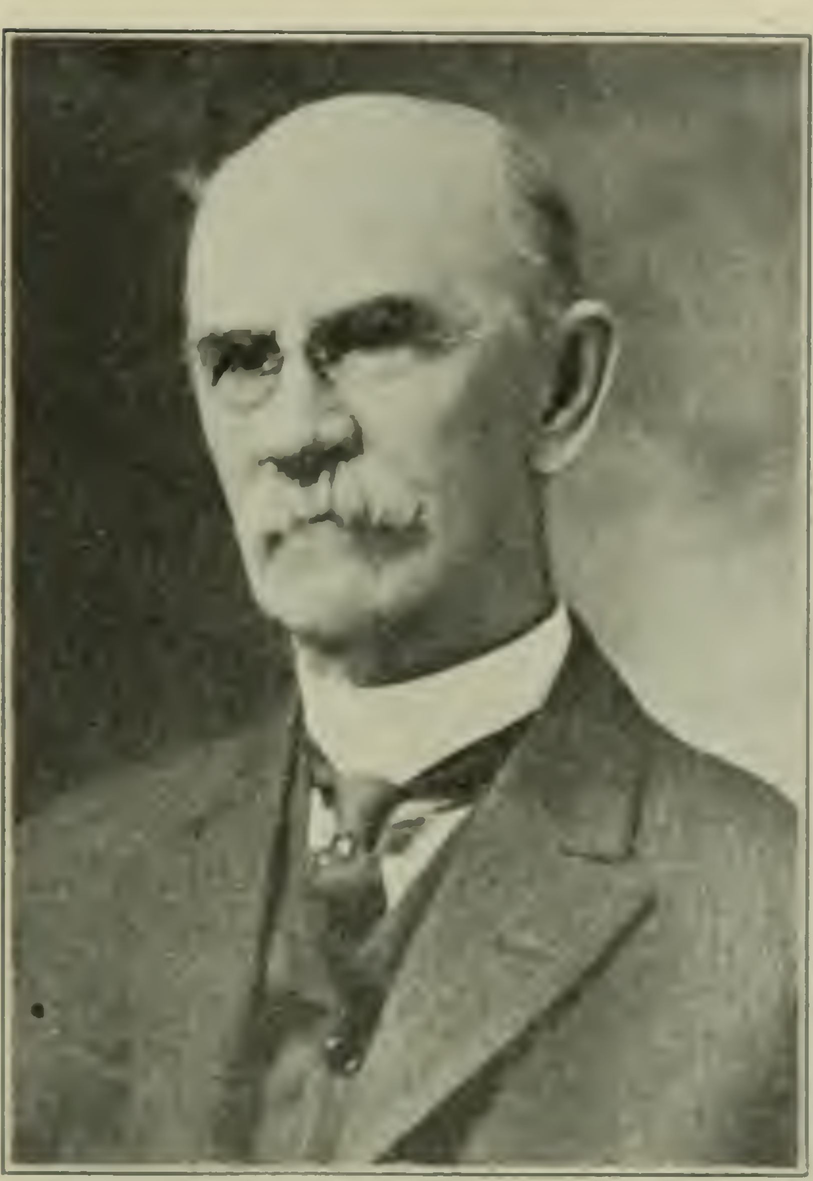
THREAT OF STRIKE SENDS BIG COAL TONNAGE TO STOCK PILES

The improvement in business to which the increase in production of coal has been attributed did not begin in all regions at the same time nor was its influence everywhere equal, it is pointed out by C. E. Lesher of the U. S. Geological Survey. It is evident that one of the most potent factors was the demand from the warring nations for foodstuffs, commodities, and manufactures of almost every kind, as well as for munitions of war. This demand was soonest felt in the manufacturing districts lying north of the Potomac and east of Chicago, inclusive. Hence the coal fields from which the fuel for for this territory is mainly drawn showed the greatest progress in 1915. There was another cause for increased output of coal, particularly in the area mentioned, the influence of which was felt perhaps as early as August and continued in effect through the first three months of 1916, namely, the storage of coal by those consumers whose supplies come from the "unionized" coal fields in which the old wage agreements were to expire April 1, 1916. There was considerable apprehension with regard to the successful negotiation of new agreements, and the possibility of a shutdown of the mines caused many consumers to adopt a policy of preparedness; as a result the buying of coal was for a period in excess of the needs for immediate consumption. The movement was initiated by the railroads and users of steam coal, particularly manufacturers with large contracts to fill, soon followed their lead. Although only incomplete statistics of storage are available, there is evidence to indicate that between the late summer of 1915 and the end of March, 1916, not less than 10,000,000 tons of bituminous coal were put into stock piles and the quantity may have been nearly 15,000,000 tons.

Jeffrey Issues New Bulletins

Bulletin No. 191 of the Jeffrey Manufacturing Co. contains interesting installation views and describes the latest improvements in the Jeffrey 29-B "Arcwall" type of coal cutter for "overcutting" system of mining, which is self-contained and self-propelled—is adjustable in all directions—will cut in the coal, dirt or shale bands, and can be built to cut anywhere above the top of rail.

Bulletin No. 192 contains full instructions for the care and operation of the Jeffrey 35-B, latest type of shortwall coal cutter, which has been designed to meet the demand for a simple rugged medium weight machine having features which make it quickly and easily handled. This bulletin also features the Jeffrey self-propelling hand truck, which permits of unloading the machine at any angle to the truck and on a spot which will require the least amount of time to handle it into the proper position for cutting.



SENATOR CHAS. S. THOMAS

Who will speak on "Mining Law Revision."

LINE BETWEEN SEMI-BITUMINOUS AND SEMI-ANTHRACITE NOT CLEAR

There is no generally accepted definition of semi-anthracite and semi-bituminous coal, with a distinct line drawn between the two. A number of systems which distinguish between the two classes of coals have been presented at different times. The earliest of these and the one that has been most widely quoted is that of Persifor Frazier, who proposes the following classification on the basis of the fuel ratio, that is the fixed carbon divided by the volatile matter: anthracite 100 to 12; semi-anthracite 12 to 8; semi-bituminous 8 to 5; bituminous 5 and less.

Survey Bulletin 326, on page 99, contains two analyses. One analysis was obtained by the old State Survey under Dr. Branner, from an averaged sample obtained by Arthur Winslow. That sample gave a fuel ratio of 8.96 which would throw the coal well within semi-anthracite class. The Collier samples gave 7.3 and 8.0. The average of the three fuel ratios is 8.0, or exactly on a line between the two classes, according to the Frazier classification.

A later proposed classification by M. R. Campbell on limited data, so far as the anthracite coals were concerned, is based on the ratio of total carbon to total hydrogen. He proposed for semi-anthracite from "26 (?) to 23 (?)," and for semi-bituminous "23 (?) to 20 (?)." According to analysis 3,176 the carbon-hydrogen ratio of this coal is 22.1 which would throw it into the semi-bituminous class, according to Campbell's scheme.

At the Thirteenth International Congress at Toronto in 1913 coal was the central theme. In a scheme drawn up for the classification of coals to be used in the papers presented before that Congress, the fuel ratio was used but the line between the semi-anthracite and semi-bituminous classes was drawn at 7 instead of at 8, as in the Frazier classification. On this basis the Bernice coal is safely semi-anthracite. (See Coal Resources of the World, Vol. 1, p. 11.) In volume 2 of the work just quoted, page 527, M. R. Campbell, describing the coals of the United States, says:

"The general practice today is illustrated by the following table: bituminous coals 0 to 3, semi-bituminous coal 3 to 6.5 (?); semi-anthracite 6.5 to infinity."

In Pennsylvania the line between the semi-bituminous and semi-anthracite coals lies in a gap between the Bernice (Pa.) Basin, the coals of which have always been taken as typical semi-anthracite, and the Blossburg Basin, a little further west, which are typical semi-bituminous. According to recent analyses, the coals of the Bernice (Pa.) Basin have a fuel ratio of from 8.1 to 9. The Blossburg coal has a fuel ratio of between 3 and 4. The Pocahontas coal of Virginia and West Virginia, which is generally quoted as a typically semi-bituminous coal, has a fuel ratio commonly under 5. The New River coal, also put in that class, has a fuel ratio of from less than 4 to over 5. The Smokeless George's Creek coal of Maryland runs from less than 4 to over 5. The Cambria County (Pa.) smokeless coal, runs from about 3½ to just over 5. With the exception of the Bernice coal, which, however, is classed in the market as anthracite, these coals are all classed as semi-bituminous coals, but it will be noted that none of them go more than a very little above 5.

It would therefore seem that the most typically semi-anthracite coals of the East average between 8 and 9 in fuel ratio, while the most typically semi-bituminous coals of the East range from 4 to 5. It would therefore seem that the line should be drawn more or less nearly half way between or around 6.5 to 7. This assumes that the fuel ratio is a fair indication of the class to which a coal should be assigned. It has always been considered the best criterion for the high fixed carbon coals, and the only one that has been extensively used.

Physically, the Russellville coal differs quite markedly from the typical Pennsylvania anthracite, for apparently the same mountain-building forces that cemented the latter into a tough "hard coal" have fractured and splintered the Russellville coal into a tender coal. The same tenderness, however, characterizes the Pennsylvania Bernice semi-anthracite. While the fuel ratio alone, judged by the Frazier scheme of classification, is uncertain, yet, taking the broader view of actual usage, which view was intended to be the basis of the Frazier classification, it would seem almost certain that the Bernice, Arkansas, coal should be classed as a semi-anthracite.

BUREAU OF MINES LIBRARY CONTAINS 11,000 VOLUMES

The Library of the Bureau of Mines, which will be housed in the new Interior Department, was organized early in 1911, soon after the Bureau was established. Since then there has grown from a collection of a small number of books and a library of about 11,000 volumes of chemical, technical, mining and scientific publications, which promises to become one of the most notable special library collections in the country.

Mrs. Edith F. Spofford, librarian of the Bureau, is a daughter-in-law of the late Librarian of Congress, Dr. Ainsworth R. Spofford. Her father was Judge William Harrison Safford, of Chillicothe, Ohio, a prominent jurist and writer on subjects relating to American history and biography.

Mrs. Spofford came to the Bureau of Mines from the Library of Congress after twelve years' experience in that great training school for librarians. At the time of her transfer, she was in charge of the catalogue of the Periodical Division of that library where she became familiar with the American and foreign technical and scientific literature.

For two years, Mrs. Spofford devoted her time to devising and perfecting a library system that would meet the requirements of the main library in Washington, and the branch libraries under supervision of the main library. With the rapid growth of the Bureau the wisdom of this course has been proved.

The main library in Washington is a clearing house for its various branches, as well as a central bureau for information, giving practical service to eight branches of the Bureau. Each station has its special collection of books, and maintains indexes of subjects pertaining to the work of that station. Library of Congress printed cards, as soon as available, are sent to the branch libraries for these indexes.

All books and publications belonging to the Bureau are catalogued and charged in the main library, the cards designating whether the book is in Washington, or at one or more of the stations.

In addition to ordering and distributing all publications received whether by purchase or exchange, the library endeavors to serve the specific interests of the scientific workers, by keeping in touch with individual investigations in the various branches, in supplying articles or books as requested, and in calling attention to other publications bearing upon such investigations. Opportunities for such service are increasing with the progress of the growth of the Bureau.

MRS. EDITH F. SPOFFORD
Librarian, Bureau of Mines

Mrs. Spofford had completed arrangements for attending the International meeting of librarians in Oxford, England, in August, 1914, when war was declared. At that time as an official representative of the Bureau of Mines, she had been authorized to visit the Government Mining Departments in England, France and Belgium, with the hope of obtaining for the Bureau valuable reports needed to complete sets of foreign mining statistics in the Bureau's library.

Appoints Kansas City Agent

The Jeffrey Manufacturing Company, of Columbus, Ohio, has opened an agency with the Gustin-Bacon Manufacturing Co., of Kansas City, in order to establish closer cooperation with their customers in Kansas, Missouri and Oklahoma, and improve their service there.

The Gustin-Bacon Company will carry a line of Jeffrey Transmission Machinery, Chains, Buckets, etc., in stock. J. S. Davidson, who has spent several years in the sales and engineering departments of the Jeffrey Company has associated himself with the Gustin-Bacon Company and will handle all inquiries for Jeffrey Products. His experience and training in the application of these products will enable him to be of great assistance to customers in solving their problems in elevating, conveying and transmission machinery, also crushing, pulverizing and screening equipment.

RALPH CREWS

Who will speak on "Cooperation in the Marketing of Coal."

CANADIAN COAL DISPLACING WYOMING PRODUCT IN NORTHWEST

Normally a considerable quantity of Wyoming coal from the Sheridan field reaches market in northern Montana, Idaho, and Washington (in and about Spokane), but Canadian coal now admitted duty free is reported to have partly replaced it and to that cause the decreased production in Sheridan County is partly due. Abundance of water in the Black Hills for the hydroelectric plants cuts off a part of the market for Wyoming coal.

BUREAU OF MINES MAN SAVES LIFE OF CITY OFFICIAL

The presence of W. J. German, of the Bureau of Mines, at the Cleveland water works tunnel, doubtless, is responsible for the saving of the life of the city director of the public utilities, P. S Farrell. Mr. Farrell was overcome in the tunnel and Mr. German, by applying the Schaeffer method of resuscitation, was able to restore Mr. Farrell to consciousness after a short interval. Mr. German was given leave of absence by the Bureau so he could be retained temporarily by the contractors driving the tunnel.

PLACER MINERS SLOW TO MAKE RETURNS TO THE GOVERNMENT

After having sent out repeated requests the Geological Survey has been able to secure statistical information from only 20 per cent of the placer mine operators in the United States. This is the only branch of mining in which any difficulty is experienced by the Survey in obtaining information

It is possible for the Survey to obtain information as to production from indirect sources, but every effort is made to have the statistics correct to the smallest detail and this is possible only by securing the cooperation of the operator. In most cases where failure to make returns occurs, the operators have no objection to furnishing the Government the figures, but the return simply is neglected

In the case of placer miners more reasons exist for the failure to reply to the cards of inquiry, than in any other class of mining. This is due to the fact that many placer mines are operated on a small scale and the operators do not remain long in one place. In this way it is difficult to reach them by mail and perhaps the property concerning which inquiry is made has passed from their hands.

There is no reason, it is believed here, why 80 per cent of these operators should fail to make returns. Evidently it is due to the disinclination on the part of some owners to give out figures as to production. Their failure to reply promptly to the cards sent out will not accomplish the end they evidently anticipate. It simply makes it necessary for the Government to go to the additional expense of sending a representative to the ground to learn for himself from outside sources as to the output of the property. This failure to make returns results in delaying important statistical reports on gold production.

ARIZONA ORES WILL BE SHOWN AT MINING CONGRESS CONVENTION

A mining exhibit will be shown under the auspices of the Arizona Board of Trade at the American Mining Congress Convention. The exhibit will be under the direction of the State Bureau of Mines.

Spain to Take More Coal.

According to Consul General Carl Bailey Hurst, of Barcelona, the Sociedad de Altos Hornos de Vizcaya, of Bilbao, Spain, has acquired three steamers at a cost of over $1,000,000 Two additional steamers, costing together $900,000, have now been added to its fleet. All these ships will be used by the company to transport foreign coal for its own works exclusively. At the same time this company has ordered two steamers at a cost of $300,000 each.

Phillip M. Riefkin, an engineer of the Bureau of Mines, is in the West inspecting fuel burning equipment.

UNUSUAL HEADWAY MARKS SUMMER'S WORK IN ALASKA

Unusual headway was made by the geological parties which worked in Alaska this summer. Alfred H. Brooks, in charge of the Geological Survey's Alaskan division, just has returned from Alaska with a flattering report as to the progress made in the territory.

Unusually propitious weather conditions made possible a larger amount of work than has been the case during any other summer. The spring was early and exceptionally good fortune was with the parties in making good connections with the river boats. These reasons added to an unusually dry summer made possible the unusual progress.

There were twelve parties engaged in work in the different portions of the peninusla. In southeastern Alaska a detailed survey of the Juneau district was completed. Owing to the importance of the operations in this district an examination was made more in detail than usual. Both topographical and geological maps were made on a scale of 2.64 inches to the mile. This mapping covers the area of the larger developments of the Juneau regions.

A reconnoissance of the southern portion of the Ketchikan district was finished. The Survey now has complete stream gauge records for a year and a half. This data has been gathered in cooperation with the Forest Service. From it, it is possible to judge that there are many important water power sites in this portion of Alaska. It can be said, however, that there are not as many power sites as had been anticipated, judging from the amount of the rainfall.

On Prince William Sound a topographical reconnoissance of the Port Wills district was completed. Unusually good weather marked the passage of the summer in this area and the progress made is described as remarkable.

The good weather extended also to the Copper River region where a continuance of geological work took place.

A detailed geological survey of the Nenana coal field was made. This is one of the three most important coal fields in Alaska. It will be pierced by the new railroad. This field necessarily will be the source of fuel for power purposes in the Fairbanks district.

Topographical and geological reconnoissances were completed of the Kantishna district which is 50 miles southwest of the railroad.

A detailed survey was made of the Marsha placer district. This is a new mineral area of the lower Yukon. Owing to their apparent importance reconnoissance surveys were made of adjacent areas.

Supplemental studies were made of the lodes at Fairbanks. Similar studies were also made at Nome. An interesting reconnoissance is reported by the party assigned to the Tolovane placer district.

Dr. Brooks himself spent two months in Alaska. His visit was confined to southeastern Alaska and the Prince William Sound country.

Copper production in Alaska continues to increase at an almost unbelievable rate. Every effort is being made to stimulate production to the utmost in order to take advantage of the high prices available.

The gold production promises to be about the same as last year. Important new territory is being prospected, however, and every indication points to the fact that Alaska will be a consistent producer of gold for many years to come.

Shipment of antimony has stopped entirely with the fall of prices.

Some scheelite is being developed in the Fairbanks district.

NO EARLY INCREASE IN OREGON COAL PRODUCTION EXPECTED

The only developed coal field in Oregon is in the Coos Bay district, on the Pacific coast. The only outlet at present for the coal is by boat, but the completion of the projected line of the Southern Pacific Company from Eugene to Marshfield will enable the Coos Bay output to reach wider markets. At present wood is largely used for domestic fuel in this territory and wood and oil are the principal fuels in the industries. The Coos Bay coal is sub-bituminous and cannot be used to any extent for bunkering. In view of these conditions no great progress is to be expected in Oregon coal production says the U. S. Geological Survey.

INVESTIGATES FAULTING IN SEVERAL MINERAL STATES

Sidney Paige, in charge of the western areal geology for the Geological Survey, has returned from an investigation in the San Juan mountains of Colorado, in the Grand Canyon, in the Yosemite Valley region and in southern California. With Robert T. Hill he has been paying especial attention to investigation of faulting. Mr. Paige also visited Lassen Peak and looked over certain features of vulcanism being manifested there. Mr. Paige paid a visit to the University of California while in the West.

Hold Markets With Difficulty

The coal fields of Tennessee are so hedged about by competing districts, in some of which the cost of mining is much lower, that it is with difficulty that the Tennessee operators are able to hold their old markets, and of course under these conditions new markets of any extent are not attainable except for some of the particularly high-grade coals.

Lyon Visits Chemical Show

Dorsey A. Lyon, who is in charge of the experiment work being done by the Bureau of Mines at the University of Utah, was in Washington last month. He attended the Chemical Show at New York.

SIXTY DEGREE GASOLINE DEVELOPS AS MUCH POWER AS THE 74 DEGREE PRODUCT

Van H. Manning, in Address, Points Out How Automobile Engines of Today are Being Constructed to Use a Much Lower Grade of Fuel Than Was Possible Two Years Ago—Casinghead Gasoline Discussed.

Speaking recently on the purity of gasoline, Van H. Manning, Director of the Bureau of Mines, said:

"The Bureau of Mines is in entire sympathy with your campaign for purity in gasoline, and wishes to be of aid, not only to all of you but to the entire country in this important matter.

"We are today facing a serious condition in the petroleum industry. We have probably reached the summit of our crude oil production in this country. According to the United States Geological Survey, our future supply of petroleum is only sufficient to last us from twenty-seven to thirty years at the present rate of consumption. This does not take into consideration any increasing demand as the years go by. In order to supply the fuel for the future automobiles, it will be necessary to make better use of our crude oil production in the future than we have in the past.

"In discussing the various problems involved, we must bear in mind that while the demand is steadily increasing, the production of crude oil, which is the raw source of the gasoline, is remaining approximately stationary if it has not been declining in the past year. A year ago gasoline was selling at 11 cents a gallon and was a drug on the market, due to the tremendous production of gasoline-rich crude produced by the Cushing Field in Oklahoma. This production, however, has declined from over 300,000 barrels of crude oil per day to less than 60,000 barrels per day.

"The Cushing crude contains from 25 to 30 per cent of gasoline. The new production which has compensated for the decline in the Cushing production, contains but from 15 to 17 per cent of gasoline. Notwithstanding the decline in the production of gasoline, the demand has steadily increased, due primarily to the increased use of the automobile. On January 1, 1916, there were two and a quarter million automobiles in use in the United States. It is estimated by the automobile manufacturers that there will be in excess of three and a quarter million in use by January, 1917, and by January, 1918, there will be in excess of four and one-half million automobiles in use. These figures are in addition to the increased use of motor trucks, farm tractors, stationary gasoline engines, motor boats, etc.

"This increasing demand for gasoline has been met partly by the automobile engineers and refiners. The automobile engineers have improved their automobile engines and carburetors, making it possible to use heavier fuels in the automobile of today, which would have been impracticable a year or two years ago. The refiners, taking advantage of the work of the automobile engineers, have been able to use heavier oils for gasoline, thereby increasing the percentage of gasoline obtainable from the given amount of crude oil. This has resulted in increasing the end point from 150° Centigrade, the end point of a year ago, up to an end point of 175° to 200° Centigrade, the end point of today.

"Let me explain to you what is meant by the 'end point' in gasoline. The end point is a term used in distillation of gasoline and is usually considered to be the temperature at which 95 per cent of the gasoline will distill off, if distilled in a proper flask at the proper rate. Recently the Bureau of Mines purchased four samples of gasoline sold in the District of Columbia. These gasolines were analyzed and the end point determined in each instance. The gravity of one was 64.8. The gravities of the other three samples ranged from 61.5 to 62. The end point of the first sample was 210° Centigrade. The end point of the other three samples was 175°. The high end point of the first sample, together with its high specific gravity indicates that this is a blended gasoline. This is further borne out by the analysis, which indicates that 21 per cent is distilled over under 75°, whereas less than 10 per cent on the other three samples is distilled over at this same temperature. This larger proportion of light products, which is responsible for the high gravity, indicates that casing head gasoline has been blended with heavy distillate, because the end point of this gasoline is 210°, as against 175° for the other three gasolines analyzed. It is possible that this blended gasoline might prove satisfactory in some automobile engines.

"The end point is important because it is a measure of the readiness of the gasoline to vaporize, which is necessary and desirable information to have in selecting suitable fuel for gasoline engines. As a result, the refiners have been able to supply a lower grade fuel, which is now adaptable to the improved automobile engines. This, of course, automatically has a tendency to keep the price of gasoline down, as it can readily be seen that if the standard of quality is higher, the supply would be more limited and correspondingly higher in price.

"This will probably explain some of the difficulties that the people are having with the character of the fuel used in their automobiles, at the present time, particularly if the automobile is of a design of two or more years ago, not having the improved engine and carburetor design, it is not equipped to use the present-day low grade of fuel.

"Refiners are cooperating along another line to the same end, namely, to increase the amount of gasoline and at the same time to keep the price down to a reasonable basis, by means of cracking kerosenes and heavier oils, thereby converting a certain proportion of the crude oil which was not formerly utilized for the purpose, into gasoline. Last year there was produced by by cracking processes approximately 2,000,000 barrels of gasoline. This year it is estimated that there will be produced more than 5,000,000 barrels of gasoline by cracking processes. This is all the more striking when it is considered that these 5,000,000 barrels of gasoline were made from oils which in the past did not enter into the making of gasoline, and indicates the possibilities of the present production of crude oil to supply the future requirements of the automobile.

"So, gentlemen, you can see that these are some of the problems that have to be taken into consideration in any specifications that are drawn up. We want to assure you as nearly as we can that you get a grade of gasoline that will be satisfactory for your needs; then we have to be sure that it is of such a grade as can be supplied by the refiners at a reasonable price. Unless the specifications do take these factors into consideration, they may result in restricting the supply and making the prices exorbitantly high, and also may deprive many people of the pleasure of owning a motor car by making the price of fuel prohibitive. With proper development of the cracking processes, and the cooperation of the automobile engineer, there is no reason why a suitable fuel should not be available for years to come and at a reasonable price.

"The Bureau of Mines has for a number of years appreciated the seriousness of the motor fuel problem; in fact, long before the sharp increase in prices of gasoline, this Bureau was aware of the conditions, and realized that this increase in prices would follow. It was at that time the Bureau began a serious investigation of this entire problem. The special investigation bearing directly on the quality of gasoline was begun eight months ago and is being continued today. Samples of gasoline were purchased in the open market in all parts of the country (and not from refiners), and were analyzed by the Bureau's engineers, and engine tests were also run on the representative grades of gasoline. The results to date are contained in a publication to be issued in the near future by the Bureau of Mines. There is also in course of publication, and nearly completed, a report on gasoline specifications, which has taken into consideration the available supply, increasing demand, and the protection of the public, as well as fair treatment to the refining industry—all with the purpose of assuring a future supply of gasoline to the public at the most reasonable prices.

"One of the results that may prove startling to the public is that the gravity of the gasoline does not of itself necessarily mean a satisfactory basis for the purchase of gasoline. Engine tests were run by the Bureau on gasoline having a gravity of from 74° to 60°. The net result of these tests showed a difference in power developed of less than 2 per cent between gasolines of 74° gravity and gasolines of 60° gravity. This is all the more remarkable when it is considered that 74° gravity gasoline is selling at 31 cents per gallon, while the 60° gravity gasoline can be purchased at 22 cents per gallon.

"It is probable that the 60° gravity gasoline, which can be purchased for 9 cents less a gallon, can be used in the automobile with the same satisfaction as the 74° gravity gasoline.

"All gasolines, under properly regulated engine conditions can be made to develop quantities of power which are not greatly different. This result was obtained from experimental work in our laboratories in Pittsburgh, and indicates that the claims made by many refineries for the power producing qualities of their gasoline are largely without foundation. It does not necessarily follow that all gasolines are equally good, but it is certain that exaggerated claims are made for the number of miles per gallon. The possible element of superiority undoubtedly lies in the quality some products have of giving maximum efficiency over a wider range of engine conditions. The fact of importance is, therefore, that if the user of gasoline takes sufficient care of his engine, he can obtain almost as good results from a cheap gasoline as from an expensive, high-test product, as the power developed under like conditions varies little in our experiments.

"Recently, owing to the remarkable development of the casing head gasoline industry, that is, obtaining gasoline from natural gas, there has been obtained a product called 'blended' gasoline. The casing head gasoline as derived from natural gas is too volatile to be used directly. It is therefore mixed with oil just a little lighter than kerosene but heavier than gasoline. Such a blended gasoline may be of any gravity desired by the manufacturer, but is naturally different in composition and properties from the straight refinery product which it may chance to resemble in gravity only. This is due to the fact that it is generally composed of more of both of the heavier and lighter oils than gasoline made by the ordinary processes. On account of the larger proportion of light oil, it is possible to use a correspondingly large proportion of heavy oil and still have an average gravity the same as ordinary gasoline, but which may act very differently in an engine on account of the large portion of heavy oil contained in the blended product. This is not intended to discourage the use or manufacture of casing head gasoline. If the casing head gasoline is blended with the proper oils, that is, oils that are not too heavy, it can be used satisfactorily in an automobile engine. Casing head gasoline is an important addition to our fuel oil resources, the production amounting to approximately 5 per cent of the total production of gasoline this year.

"The Bureau of Mines is now preparing gasoline

THE
MINING CONGRESS
JOURNAL

Published Each Month by
THE AMERICAN MINING CONGRESS.
Munsey Building. Washington, D. C.

Subscription Rate, per year............. $2.00
Single Copies.......................... .20

Entered as Second Class Matter January 30, 1915, at the Postoffice at Washington, D. C.

NOVEMBER, 1916

specifications for the General Supply Committee of the Federal Government, which will undoubtedly be of interest to all users of gasoline. These specifications should be issued within the next ninety days, and I shall be very glad to see that the members of the Retail Merchants' Association receive copies.

"For your information, I might also say that the Bureau of Mines has a complete testing laboratory, equipped with engines and other necessary apparatus, with which it will be possible to make power tests on gasoline, as well as on other internal combustion engine fuels. The results of these tests will be available to the general public, and will be of the utmost importance in clearing up the difficulties with which you are confronted today.

"The Bureau of Mines has arranged to cooperate with the Curtiss aeroplane manufacturing concern to test their gasoline in order to arrive at a satisfactory gasoline for aviation purposes for use by the United States Government. Of course, this is a gasoline for a special purpose, and of a character in which the average automobile user is not interested.

"In conclusion, gentlemen, I wish to emphasize the necessity of bearing in mind the following consideration in your efforts to obtain purity in gasoline. We must keep before us the fact that there should be the greatest possible use of the raw materials consistent with economic results. For instance, no specifications should be drawn up which would exclude certain materials now being used satisfactorily, for if eliminated, this would correspondingly restrict the supply and automatically increase the price. This of course, is not desirable. The Bureau is exceedingly anxious that all the available resources for the making of gasoline be used to their greatest extent, and it is also interested in the encouragement of further economy in the design of the automobile engine. Any specifications that would restrict the use of some of the low-grade oil resources would at once stop any further efforts toward improvement in engine design. At the same time, the Bureau is interested in seeing that the public obtains a satisfactory fuel.

"To these ends, the entire facilities of the laboratories of the Bureau of Mines are at your disposal. I wish you great success in your undertaking."

SAYS GOVERNMENT'S PUBLIC LAND POLICY IS SOCIALISTIC

A case that has attracted much attention among lawyers was argued in the United States Supreme Court last week. The Government brought suit against power companies in Utah to oust them from the public lands. The interest of the United States was shown by the fact that briefs were filed on behalf of the State of Utah and five other States, setting up their right to control the use of their waters as a part of their general powers to govern their internal affairs. This claim of the Western States is based upon their admission into the Union on an equal footing with the original States.

"It is not generally known, I presume, that 80 per cent of Utah is still public land," said H. J. Dawes, a lawyer of Colorado, in discussing the case, here. "So in Colorado, I think, fully two-thirds of the State is public land. All of the Western States have great reservations, and the conservationists have gone plumb crazy in their efforts to keep the land from settlement or even improvement. The case now before the Supreme Court involves the right of the States to control their own land. The Federal Government has pursued a policy which gives it almost absolute control over all privately owned land in the event enterprise seeks to obtain concessions from the Government. For instance, if a corporation or other owner of land contiguous to public lands in carrying out a project seeks a roadway across a strip of public land, be it ever so small, the Government will not grant the right until the corporation or owner signs a contract under which the Government in reality becomes the dominant power over the privately owned land, reserving the right to dictate the sale of the land to whomsoever it names, and in any event to become the owner in fifty years. It is really a form of government socialism, and the Western States want to find out whether they have a different status from the other States simply because they happened to come into the Union later."

CONGRESS TO BE ASKED FOR PETROLEUM EXPERIMENT STATION

An effort will be made to induce the next Congress to appropriate for a petroleum experiment station. This station will be devoted to testing, cracking, refining and dehydrating petroleum, if it is allowed.

NATION'S FIRST COOPERATIVE SELLING AGENCY ORGANIZED

Formation of the first organization for cooperative selling to give an American industry an advantage over foreign competitors in foreign markets was announced by the Bureau of Foreign and Domestic Commerce. The organization consists of an export sales company representing 80 per cent of the Douglas fir cut in this country, and the bureau considers that it will give American lumber a decided advantage in the trade struggle that will follow the war.

"The American campaign to capture foreign lumber markets has resulted in the organization of an export sales company by Western lumber manufacturers," said a statement issued by the Bureau. "This company represents 80 per cent of the Douglas fir and Western hemlock in the world's lumber markets."

"It is expected, without violating the present anti-trust law, to give American manufacturers some of the advantages that were hoped for from the Webb bill, which the last Congress failed to pass.

"The organization of this company is regarded as the most important and far-reaching step the industry has taken to broaden its markets and meet the competition of the thoroughly organized lumber exporters of northern Europe. In conjunction with the investigation of European lumber markets recently undertaken jointly by the lumbermen and the bureau of foreign and domestic commerce, it should give American lumber a decided advantage over all competitors in the trade struggle that will follow the war.

"Immediate attention will be given to standardization of grades, to the conditioning of export lumber and an active propaganda in foreign countries. Lack of attention in the past to these very important details accounts in large measure for the failure of American lumber to hold its own against more efficient competitors.

"The company was organized as a result of meetings of interested lumbermen held recently at San Francisco, and the following officers are announced: President, W. H. Talbot; general manager, A. A. Baxter; secretary, Charles E. Hill."

The organization of the company is understood to have been approved by representatives of the Federal Trade Commission, who have been on the Pacific Coast for some time.

This event led to the following editorial comment in the *Washington Post.*

"The announcement that Western fir manufacturers representing 80 per cent of the output, are the first in any line of industry to secure permission from the Federal Trade Commission to organize for the development of foreign commerce is an item of peculiar interest. It shows that the lumbermen are running true to form as one of the most progressive bodies in adopting cooperative methods for the enhancement of mutual profit and advancement of American trade.

"There is no other great independent industry in this country so thoroughly organized today on a service basis as lumbering.

"In the general commercial field the lumbermen have a national organization serving as a center, about which cluster in more or less close affiliation numerous independent bodies, each covering its own particular field. The hardwood association endeavors to coordinate the work of all those manufacturers engaged in the production of hardwood lumber and conform to it the requirements of the retailers, as brought out by the National Retail Lumber Dealers' Association. Grades, measurements, shipping rules, freight rates and countless other matters of common interest are worked out in harmony.

"Manufacturers of hemlock, pine, cypress, redwood and other specific lines are organized in separate bodies, each having its own work to perform. In some instances they have established elaborate headquarters, with staffs of experts having charge of broad investigations and novel laboratory and field experimentation. The redwood manufacturers first established by thorough experimental work the suitability of that timber for silo construction; then by cooperative advertising, captured a big share of this growing field. Later the cypress men, finding their timber peculiarly adapted for this use, started out to gather in some of the trade. Curiously enough, though they have developed a profitable business in this line, this has not been done at the expense of the other wood. The combined advertising, rather, has resulted in so great a demand for silos that both organizations are pushed at times to fill their orders.

"Southern gum and Northern hemlock were for many years confined in use to sheeting and other of the cheaper forms of construction. Lately manufacturers of these woods have combined in separate organizations for the discovery of more profitable employment in their products. By careful experimentation they have succeeded, and by well-directed publicity they are obtaining a sale for the higher grades of these timbers for interior finish and flooring. Birch and maple are both represented by strong associations, and there are many other sturdy organizations, each representing some particular district. The White Pine Bureau of St. Paul represents the manufacturers of six Northwestern States. On the Pacific the West Coast Lumbermen's Association represents thirty-seven manufacturers in two States and a Canadian province. The producers of gum in Mississippi and of pine in the Calcasieu District, of Louisiana, North Carolina, Arkansas and other sections have their own organizations, through which they advertise their products and protect their marketing interests.

"Ten congresses and conventions, representing various groups of lumber producers, are to be held within the next thirty days, and these are but a fraction of the total."

Bureau of Mines to Have Exhibit

The Bureau of Mines will have an exhibit at the National Safety Council Exhibition, at Detroit.

H. G. JAMES
Who will speak on "A Federal Oil and Gas Bureau"

SALT WATER IN OIL FIELDS DIFFERS FROM THAT IN OCEAN

The generalization that oil is found in anticlines where the strata are saturated with water and in synclines where the rocks are dry, holds fairly well in the oil fields of the United States, though there are only a few fields in which the latter condition obtains. Thus in the Appalachian fields all but the deepest sands carry water under considerable head, and the oil and gas usually occur in anticlines or on structural terraces. In some localities the sands appear to contain no water, and in these pools the oil may be found in synclines.

The Clinton sand of Ohio, however, seems to carry little water yet the hydrocarbons are usually found in anticlines or structural terraces.

In the Texas and Oklahoma fields the sands generally carry water and the oil and gas usually occur in the anticlines. In California conditions are different, the oil for the most part having migrated from lower formations and collected in porous lenses in the higher beds; it may, therefore, occupy anticlines, synclines or even practically smooth monoclines. The California fields are located in a very arid region, because of the peculiar conditions that have controlled the accumulation of the California oil, it is not practicable to compare these fields (as regards rainfall and relation of oil to this structure), with other fields of the United States.

The fact that oil field water is generally salt water seems to indicate that if the amount of rainfall bears any relation to the occurrence of oil, this relation is not a direct one. The U. S. Geological Survey's investigations in the California fields show that the deeper waters are, as in other oil fields, strongly saline. In some instances they correspond almost exactly with the water of the present ocean, as regards both composition and concentration. The chief differences between these waters and ocean water are *(a)* decrease or complete absence of sulphate in the oil field water, and corresponding increase in carbonate: *(b)* decrease of the magnesium-calcium ratio, the calcium being in many cases more abundant than the magnesium. This water is believed to be essentially connate water—*i.e.*, sea water entrapped in the beds when they were laid down. The decrease of sulphate is probably due to interaction with the hydrocarbon material of the petroleum, by which the latter is oxidized to carbonate, and the decrease in magnesium may be due to dolomitization. Near the outcrop of the beds the water is not a pure connate type, but is mingled with meteoric water, which in that region conatins chiefly sulphates. Under some conditions this sulphate water may be changed to a carbonate water, presumably by the action of the hydrocarbons. Thus the shallower waters in these fields carry chiefly sulphate, while those associated with the oil carry either carbonate or chloride, depending on the proportions in which meteoric and connate waters have entered into their composition.

In the Appalachian oil fields, however, the waters are of very different character, being strong brines or bitterns. Most of these waters are highly concentrated, and the ratio of calcium and magnesium chlorides to sodium chloride is in some cases 1 to 1 instead of about 1 to 4, as in sea water. In these fields, therefore, meteoric water does not seem to have access to the oil bearing stratum, and this condition is probably more common than that which obtains in the California fields. In other words, the very fact that oil can accumulate and remain in the strata during long periods of time indicates that if salt water were originally included in the rocks it would be retained also, and that any extensive incursion of meteoric water would dissipate both. Whether the oil occurs in limestone or in sandstone, it is therefore natural to expect the associated water to be salty.

INDIANA PREPARES TO REVISE MINING CODE IN NEAR FUTURE

Charles Kettleborough, of the Indiana Legislatice Bureau, and member of the State Commission on Mines and Mining, was in Washington last month compiling information with regard to laws in other States having a bearing on mining. It is the intention to revise the mining code of Indiana at the next session of the legislature.

ADVANCE IN METALLURGY FACTOR IN PRODUCTION

A feature of the copper industry during the past few years, as is pointed out by B. S. Butler, of the Geological Survey, is the great improvement in metallurgical practices. The blast furnace that was long such a factor in copper metallurgy has been in a large part replaced by the reverberatory.

The great increase in concentrating ore treated during recent years has served to emphasize the lamentably large losses by the older concentration processes.

The flotation process which promises a revolution in concentrating methods will be a very important factor in the 1916 production, Mr. Butler predicts. Leaching, he thinks, will be restricted to classes of ore not susceptible to treatment by the flotation process as at present developed. The improved processes promise to add from 10 to 20 per cent to the metal recovery of concentrating ore, Mr. Butler believes.

Smelter Sampling Discussed

A bulletin descriptive of smelter methods of sampling has been issued by the Arizona State Bureau of Mines.

For Faster Hoisting
For Greater Output
For Positive Action

Install The H. & H.
Self-Dumping Cage

∴

The Automatic Car Release and the Safety Catch, exclusive features of this labor-saving hoist, have a decided bearing on the reduction of your hoisting charges.

You will be interested in full details

Herzler & Henninger
Machine Works
Belleville Illinois

RADIUM FOUND IN TWO PRINCIPAL TYPES OF MINERALS

Radium is found in two principal types of minerals—as pitchblende, occurring only in granitic rocks, and in the oxidized minerals which have been formed probably from the breaking down of pitchblende and have been carried to other places in solution. The principal mineral of the oxidized group is carnotite, the yellow and generally powdery mineral which is found in considerable quantities in southwestern Colorado and southeastern Utah.

Other oxidized minerals such as torbernite and autunite are found in the veins which carry pitchblende or in the oxidized portions of thos- veins which are thought to have contained pitcheblende at one time. They are of little commercial value, although they have been mined as a source of radium in Portugal and South Australia.

COAL MINE OPERATORS OFTEN SELL AT LOSS, MR. LESHER SAYS

The bituminous-coal operator does not as a general rule ascertain carefully the total cost of producing his coal and thus establish a price below which he will not sell, but he usually takes what he can get for his product, probably believing that in dull times it is better to accept a loss in sales than to close the mine, and hoping that he can retrieve his fortunes when conditions are more prosperous, says C. E. Lesher, of the Geological Survey. The contract prices for coal are governed to a considerable extent by the optimism, or the reverse, of the mine operator. During dull times the prices are low, as there is more coal available than is needed, and these prices are somewhat slow in responding to the upward trend when business improves, either because by chance the improvement begins after the period of fixing contract prices or because the change in the tide is not realized or appreciated by the coal trade until it is well on its upward way, Mr. Lesher says.

CALIFORNIA LAW HAMPERS PRODUCTION OF COPPER

The decline in copper production in California is due to a considerable extent to the necessity of eliminating smelter "smoke" ingredients injurious to vegetation, the Geological Survey points out. This has resulted in closing all but one of the smelters in the Shasta County district. California originally was one of the largest copper producing States of the West. At one time it was second only to Michigan in copper production.

DR. M. D. FOSTER
Chairman, House Committee on Mines and Mining

SUPREME COURT REFUSES TO REVIEW STRIKE CASE

The Supreme Court has refused to review the convictions of four leaders in the 1913 West Virginia coal strike, who were sentenced to six months' imprisonment for contempt of court in failing to obey an injunction by the federal district judge.

The cases are another outcrop of litigation in connection with Judge Dayton's decree that the United Mine Workers was an unlawful conspiracy in its organization and operation. The defendants were members of the union and were found guilty of inciting miners to leave or refuse employment. Their conviction was affirmed by the Fourth Federal Court of Appeals on the theory that Judge Dayton's decree against the United Mine Workers was valid.

The conspiracy case is set for reargument before the Supreme Court during the present term.

The four leaders were Fannie Sullens, Frank Ledvinka, James Oates and Hiram Stephens.

ROUTT COUNTY COAL FINDING MARKET AS FAR EAST AS OMAHA

A good quality of coal is being mined in Routt County, in the northwestern part of Colorado, and several new developments of considerable size are shipping their product out over the line of the Moffat road, recently completed to Craig, on Yampa River. This coal is being marketed as far east as Omaha and it is reported that it has been found to be a good domestic coal.

ARGENTINA IS INTERESTED IN DR. SMITH'S PAPER

To comply with a request made by the Argentine section of the Pan-American Scientific Congress, a translation into Spanish has been made of the paper of Dr. George Otis Smith, Director of the Geological Survey, on "The Public Interest in Mineral Resources." This paper was read by Dr. Smith on the occasion of the conference which was held in Washington last winter.

Latest Legal Decisions

OPTION CONTRACT

An option contract to purchase the mineral resources in and under certain described land underlaid with a coal vein 34 inches or more in thickness is not satisfied or complied with, on the optionee's election to complete the purchase, by a deed purporting to convey coal, "the one mineral resource," without even describing it as of the required thickness, and on the tender of such a deed the optionor or seller cannot recover the purchase price named.

Auten *vs.* Mayor Coal Co. (Kansas), 158 Pacific, 13, p. 14; June, 1916.

EXTRALATERAL RIGHTS

By Section 2322, R. S., U. S., giving locators exclusive right of possession and enjoyment of all the surface included within the lines of their locations, and of all veins, lodes and ledges throughout their entire depth, the top or apex of which lies inside of the surface lines, although such veins may so far depart from the perpendicular as to extend outside the vertical side lines of the surface locations, Congress contemplated that the locator of a mining claim might discover more than one vein within his surface boundaries and gave him all veins, lodes and ledges throughout their entire depth. If a vein in the form of a single anti-clinical fold may be said to have an apex, there is nothing in the statute which militates against extralateral rights upon such vein in opposite directions, the same as though it were two veins with separate apices instead of one vein. Under such circumstances the locator is entitled to extralateral rights in opposite directions inasmuch as the end lines of his claim must necessarily have two directions, and the statute cannot be construed as limiting end lines to one direction only.

Jim Butler, Tonapah Min. Co. *vs.* West End Cons. Min. Co. (Nev.), 158 Pacific, 876, p. 879; June, 1916.

CONVEYANCE TO CO-OWNER

The purchase of an interest in a mine by one co-owner from another cannot be declared fraudulent and the deed transferring the property annulled and the conveyance set aside on the ground of fraud in the violation of confidential relations and on the ground of the fraudulent concealment of valuable ore bodies known to the purchasing co-owner and unknown to the selling co-owner, where it appears that the purchasing co-owner had the supervision of the operation of the mine and a strained and unfriendly relation had existed between the parties for months; during a part of which time no communications had passed between them, and where the grantor knew that the grantee had previously claimed that the grantor had beaten him out of a large sum of money and where it also appeared that the valuable ore bodies alleged to have been discovered by the grantee and by him concealed from the grantor were known to the grantor and had been known and had been tested for mineral for at least three years and that the ore was not of sufficient magnitude or value to warrant its working as a commercial ore body and that these bodies did not add commercial value, but a speculative value only, to the mine, and that the valuable ore bodies discovered by the grantee were in fact discovered long after the agreement to convey had been reached.

Richardson *vs.* Heney (Arizona), 151 Pacific, 980, p. 984.

RAILROAD RIGHT OF WAY

A person who located a mining claim on the public lands and subsequently abandoned the same as a mining location and immediately returned and established a homestead residence upon the land is not in a position to question the right of a railroad to occupy and use a part of such land for its right of way on the ground that the railroad had no capacity to accept the grant from the government, where the appropriation was made prior to the time it was occupied as a homestead residence, for the reason that by the abandonment of the mineral location the original locator had no interest in the land as a homesteader at the time the railroad acquired its right of way and constructed its road.

Van Dyke *vs.* Arizona Eastern R. Co. (Arizona), 157 Pacific, 1019, p. 1023; June, 1916.

CONTROLLING ELECTIONS

The election of sheriff, county clerk, county assessor and county commissioners for the County of Huerfano, Colorado, in the election of 1914, was declared illegal and the contest sustained on the ground that the proof showed that the Colorado Fuel and Iron Company and the Victor Fuel Company connived with the Board of County Commissioners of the county and with other officials and politicians, and thereby secured the creation of election precincts so bounded as to include the private property only of the coal companies and the lines of the precincts were marked by the fences of the companies or guarded by their own armed men, these places having been known as "closed camps" within which only the employes of the company were permitted to enter and the public not only excluded but warned that any entrance constituted a trespass. The companies deny the right of free public assemblage within the precincts as established, and the right of free and open discussion of public elections and the right to circulate election literature, and prohibited candidates of one party from entering within the precincts. It also appeared that the coal companies secured the selection of their own employes exclusively as judges of elections and caused the registration lists to be made from their own payrolls and kept them in their private places of business in charge of their own employes, prohibiting all public investigations as to the qualifications of the persons registered as electors of the different precincts. Proof also showed that these coal companies, through their employes, assisted foreigners not familiar with the English language to vote by marking their ballot in violation of law and that the companies furnished or caused to be furnished such voters a fraudulent device by which they could vote for certain persons upon the ticket without being able to read either the name of the candidate or the title of the party ticket. The proof also showed that the activities of the coal companies in control of the elections on election day were so outrageous as to make necessary the presence of a detail of Federal soldiers to protect and escort legal and qualified voters to the polls. The Supreme Court of Colorado, in reversing the lower court, says, in its opinion: "We are unable to find a precedent where like or similar conditions have been considered as in this case wherein private corporations have assumed to deny the pubilc character of an election and to arbitrarily take charge of and conduct the same as if it were the sole private business of the corporation. These companies plainly connived with certain county officials to secure the creation of election precincts, bounded so as to include their private property only, and with lines marked by their own fences, or guarded by their own armed men, and within which were only their own employes. They excluded the public from entrance to such election precincts, labeled the same as private property, and warned the public that entrance thereon constituted trespass. They denied the right of free public assemblage within such election precincts, and likewise the right of free or open discussion of public questions therein. They denied the right to circulate election literature or the distribution of the cards of candidates within such precincts. They secured the selection of their own employes exclusively as judges and clerks of election, and by the location of precinct boundaries no others than their employes could so serve. They apparently made the registration lists from their pay rolls. They kept such lists in their private places of business and in charge of their employes. They prohibited all public investigation within such election precincts as to the qualification of the persons so registered as electors of the precinct. Through their employes acting as election officials they assisted numerous non-English-speaking persons to vote by marking their ballots for them, in plain violation of the law. They provided other non-English-speaking persons with the fraudulent device heretofore described, by which such persons might be enabled to vote the Republican ticket without being able to read either the name of the candidate or the party ticket for which they so voted. They coerced and intimidated their employes in many instances. We find no such example of fraud within the books, and must seek the letter and spirit of the law in a free government as a scale in which to weigh such conduct."

Neelly *vs.* Farr (Colorado), 158 Pacific, 458, p. 466; July, 1916.

STEAM SHOVEL GIVES COAL FIELD NEW LEASE ON LIFE

The mining of coal in open pits by means of steam shovels has become an important feature in the coal fields in Crawford and Cherokee Counties in Kansas. This method of mining has effected large economies in the cost of operation as compared with underground systems and has given these fields, in which the coal beds are thin and expensive to mine, a new lease on life.

THREE STATES PRODUCE 82 PER CENT OF U. S COPPER

Montana, Michigan and Arizona are the three great copper producing States. Montana ranks first with nearly one-third of the entire output of the country. Michigan is second with more than 26 per cent. Arizona ranks third with nearly one-fourth of the country's copper production.

Utah, which has risen rapidly as a copper producer in recent years, has produced one-sixteenth of the total output of the country. The three first named States, however, have produced 82 per cent of the entire production of the country. These figures were compiled by B. S. Butler, the copper specialist of the Geological Survey.

New Sales Manager Named

F. W. O'Neil, sales manager of the Nordberg Manufacturing Company, of Milwaukee, will sever his connection with the company, November 1, to enter other fields. H. W. Dow, for many years connected with the company in various capacities, has been appointed sales manager.

Mr. Dow is an able engineer, well versed in all kinds of power problems. During his service with the company he has carried out important engineering work.

ARIZONA BUREAU OF MINES PUBLISHES BULLETIN IN SPANISH

Beginning November 1, the State Safety News, published monthly by the Arizona Bureau of Mines, also will be published in Spanish. Inasmuch as the proportion of Spanish-speaking laborers in the mines of Arizona is large, and the necessity for education along safety lines is even greater for these employees than for the Americans, it is felt that considerable benefit will be derived by this means.

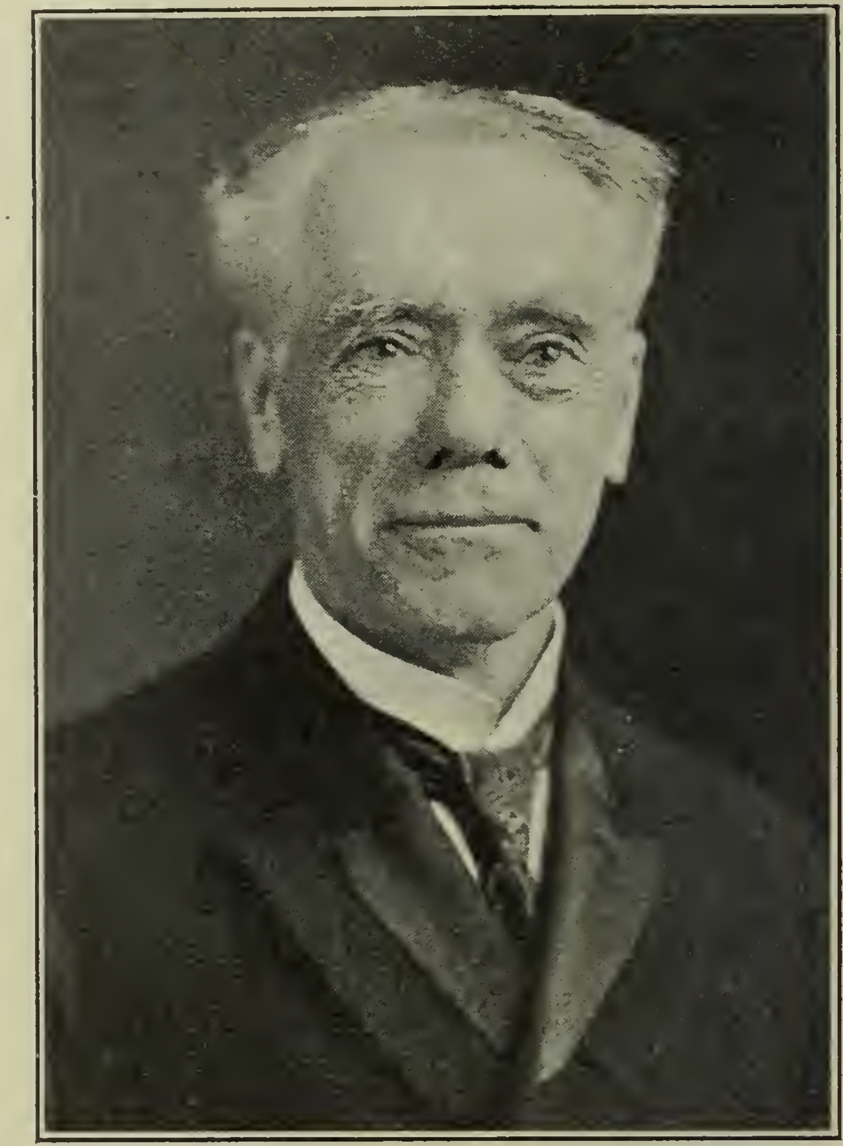
BASTIN TO EXAMINE BRADEN MINES IN CHILE

Dr. E. S. Bastin, of the U. S. Geological Survey has been extended a leave of absence for one year, during which time he will make an examination of the Braden Copper Company's mines in Chile. He will be associated in this work with Waldemar Lindgren, the head of the division of geology of the Massachusetts Institute of Technology.

STRIKES HAVE INTERFERED LITTLE WITH COAL PRODUCTION

Within recent years the time lost because of labor strikes has not interfered except locally with the production of coal. The possible effect of a shutdown of the mines during the progress of wage negotiations in the bituminous fields is usually discounted in advance by the storage of coal, and in other years the total possible working days lost because of labor disaffection amount to but 1 or 2 per cent of the total active days.

BUREAU OF MINES LEGAL ADVISER AN AUTHOR OF NOTE



JUDGE J. W. THOMPSON

Chief of legal division of the Bureau of Mines.

Judge J. W. Thompson, a law examiner of the Bureau of Mines, was born on a farm near Shelbyville, Ind. He continued to live and work on the farm until 23 years of age. During this time he secured such an education as was afforded in the public schools of Shelbyville. Following his graduation from high school, he taught two years in the vicinity of Shelbyville. He then took a course in Hartsville University, followed by a course at Franklin College, and afterwards studied law. He was admitted to the bar and practiced law in Winchester, Ind., where he continued this work for twenty-one years. During this time he did a great deal of law editorial work, which led finally to his acceptance of a position as editor and law writer with the Bobbs-Merrill Company, law-book publishers of Indianapolis. Here he spent ten years, during which time he gave special attention to and wrote extensively on mining law for the technical mining press. It was through these writings that he became known to the Director of the Bureau of Mines and this led to his appointment as law examiner for the Bureau. He came to the Bureau April 1, 1911, and has continued with it since.

Judge Thompson has been a prolific writer and is the author of thirty-two volumes, some of them containing as high as 1,600 pages each. His principal publications are: "Thompson on Corporations," a nationally known work; "Thompson's Ohio Trial Evidence," considered a classic in Ohio; "Thompson's Indiana Forms;" "Notes on Indiana Decisions," and "United States Mining Statutes Annotated," which made the Federal Mining Law readily available for the first time.

CHEMICAL INDUSTRY NOT READY FOR MORE STATISTICS IT APPEARS

A circular recently was sent out by the Geological Survey to the producers of aluminum salts. These producers were asked if they could make use of more diversified statistics on aluminum salts. They were asked to indicate what divisions in the present statistics would enable them to have a better understanding of the industry. Only 25 per cent of the manufacturere replied. This is taken at the Survey to indicate that the industry is not ready for more detailed statistics at this time. This applies to practically the entire chemical industry, it is believed.

CLARK MAY ATTEND CHICAGO CONVENTION

Will L. Clark has resigned as manager of the United Verde Copper Company, a position he has held since 1904. The resignation has been accepted with the keenest regret by both Senator W. A. Clark and his son, Charles W. Clark, who is general manager of the Clark interests in Arizona. Will Clark will devote his time to several companies in which he is interested in Arizona and also to interests in Montana. For some years Mr. Clark was a director of the American Mining Congress, and has always taken a deep interest in its work. Whenever possible he attends its annual convention and has now promised to participate in the proceedings of the Congress at Chicago in November.

Since 1889, Will L. Clark has been connected with the organization of Senator Clark, rising steadily until he became assistant manager of the Clark mines at Butte. As a result of his splendid management these mines had the reputation of being the safest in the district.

In 1904, Mr. Clark came to Jerome, Ariz., as manager of the United Verde. Some of the most effective mine safety methods in use today originated and were perfected under his management at the United Verde. In 1907, Mr. Clark was named Chairman of the Arizona Mining Code Commission which, after three years of preparation, study and compilation, presented the measure which is today known as the Arizona Mine Inspection law.

ALL CLASSIFICATIONS OF COALS ARE UNSATISFACTORY

All classifications of coals are more or less unsatisfactory, the lines of division being necessarily arbitrary. As a practical and sensible, as well as a very simple working basis, Campbell's differentiation of peats, lignites, subbituminous and bituminous coals, is used by the Geological Survey. The discrimination of semibituminous, semianthracite and anthracite is based upon the Pennsylvania system.

David White, chief geologist of the U. S. Geological Survey urges a study of the coals from the standpoint of the content of oxygen in the water-free combustible matter, the oxygen-content being the most important index to progressive devolatilization of the ordinary run of coals and so of the rank of the coal.

ELECTRIFICATION OF C. M. & ST. P AFFECTS MONTANA COAL MINES

The demand for Montana coal for railroad fuel, particularly for coal from the Roundup field in Musselshell County, has been curtailed by the electrification of a portion of the Chicago, Milwaukee & St. Paul Railway, but this was offset during the second half of the year by a good market for coal for domestic and commercial uses.

TURN TO OIL SHALES AS OIL SUPPLY BEGINS TO FAIL

An investigation now in progress by the Geological Survey and the Bureau of Mines is looking ahead to the time when the present increase in petroleum production will give place to a general decline. Already in no less than eleven States, the crest of the wave of production seems to have passed, although the States of Oklahoma, and Wyoming with increasing yields are more than offsetting the decline in the other States.

In view of the rapidly growing demand for gasoline and other petroleum products it does not seem too early to be taking account of stock for the future. Therefore, in addition to the attention being given to increasing our geologic knowledge bearing on the possible extension of oil fields, the Geological Survey has begun to study the bituminous and oil shales.

One belt of black shales extends from New York to Kentucky and Tennessee. Another large area is in Colorado, Utah and Wyoming. These vary in richness. In Utah the bituminous shale from one bed yields as high as two barrels of oil to the ton. The black shale at New Albany, Ind., yields on distillation only 7 to 12 gallons of oil to the ton. Elsewhere in Indiana and Illinois the shale overlying one of the coal beds has yielded one-third to one-half barrel and this shale is being removed in stripping the coal and is thus at present a waste product. While this source of oil is not promising under present conditions, yet we are learning how wide spread are these occurrence of oil-bearing rocks and how large in the aggregate is their content of oil. Dr. Ashley, for instance, has figured that one bed of this shale in Indiana contains 100 billion or more barrels of oil.

Bituminous shales were utilized abroad before Pennsylvania oil was discovered and their distillation may be a part of our chemical industry at some future day, and indeed that day may not be far distant, so rapid is the industrial development of today.

INCREASED USE OF MACHINES TO COME IN ANTHRACITE FIELDS

Prior to 1911 the quantity of machine-mined anthracite in Pennsylvania was negligible. Although mining conditions, particularly in the southern part of the anthracite field, are unfavorable to the use of the types of machines now employed in the soft-coal regions and the attitude of labor has not encouraged their introduction, it seems inevitable that the operators, in the face of increasing cost of mining and with an economic limit beyond which, because of competition with soft coal, gas, and coke, prices cannot be further raised, will within the next few years be obliged to adopt and adapt mining machines, for by no other means can material economies in cost of production of anthracite be effected in the opinion of Geological Survey experts.

FREDERICK LAIST

Chemical Expert, Anaconda Copper Company, who will speak on "Electrolytic Separation."

CONDITIONS IN MID-CONTINENTAL FIELD EXPECTED TO IMPROVE

Reporting on conditions in the Mid-Continental oil field the Federal Reserve Board's report says:

"There has been a perceptible slackening in development operations throughout the mid-continent oil field since the recent curtailment in runs by the pipe-line organizations and the decrease in the price of crude oil, yet it is the general belief in oil circles that conditions can not help but steadily improve. Uncontradicted rumors are that a large foreign corporation of immense resources will soon begin the erection of a pipe line crossing Oklahoma and Kansas and running to St. Louis. The general belief in this action is one of the factors contributing to the present confidence. Reserve stocks of petroleum are said to be the lowest in history, while there is undoubtedly a rapidly multiplying demand for all classes of petroleum products. Mid-continent production for the first week in September showed a decrease of 120,000 barrels daily from the recent high record. The Cushing (Okla.) production is now at the rate of 63,150 barrels a day, whereas this pool produced over 325,000 barrels daily at its best point in 1915. Since July 24, there have been seven distinct reductions in the price of crude oil, the total reduction being .65 cents, and the present price, which has prevailed since the latter part of August, is 90 cents.

"Activity continues in the Wyoming oil fields, where large amounts are being invested. The valuation in the oil fields of that State has increased from $1,446,478 to $2,572,422 between this time last year and the present, and the increase is growing rapidly."

COAL TAR DYES FEATURE OF CHEMICAL SHOW

Without question, the principal feature at the Chemical Show at New York was the exhibit of American coal tar dyes, according to James H. Hill of the Geological Survey. The contrast between the exhibit this year and the exhibit of last year is very striking, Mr. Hill states.

"The whole show was remarkable," said Mr. Hill, "when it is compared with the exhibition of a year ago. It is a clear indication of the remarkable progress that has been made by the chemical industry during the past year. One of the things which impressed me was the diversified nature of the products exhibited. So many of the salts which formerly were obtainable only abroad are now being manufactured in this country, as was strikingly set forth at this exhibition.

"Personally, I was most greatly interested in the barium and strontium salts. Before the war, practically all barium salts used in this country were imported. During 1915, 8,000 tons were manufactured domestically. This amount is steadily increasing since the last figures were compiled, and I predict that within the next two years American manufacturers will be able to supply the entire domestic demand. Another promising feature is that this manufacturing is not confined entirely to one part of the country. While the principal factories are in the East, other factories are springing up in other sections of the country.

"Particular attention seems to have been directed to the exhibit of silica glassware. It seems to be the consensus of opinion that this product has a future.

"Chemists and assayers were particularly interested in the improved balances which were on display. The improvement in this important part of the equipment of a laboratory or assay office indicates a great step forward."

Iowa Mines Not Holding Their Own

The largest use for Iowa coal is by railroads and for domestic purposes, as Iowa is primarily an agricultural State crossed by many of the western trunk lines. That the production of coal in this State, which for ten years has ranged between seven and eight million tons, has not kept pace with the increase in population and in railroad activities owing to the inroads that coal from other States, both east and west, have made on the natural markets for Iowa coal.

Latest Mining Patents

REFINING METHOD AND APPARATUS

No. 1,199,903. This invention is by Arthur Neal Kerr, of Tulsa, Okla.

This invention relates to a method and apparatus for treating lighter runs of oil well products and particularly to a method and apparatus to treat casing-head gasoline, whereby all of said gasoline is utilized and separated and whereby the entire process of separation into various fractions may be carried out in a single operation.

It is an object of the invention to provide a method and apparatus for first distilling and then separating casing-head gasoline or the like, and in one operation employing its light fractions or "tops" to enliven a low-grade product, thus increasing the value of such product and at the same time save the "tops." It is another object of the invention to provide a method and apparatus where the entire process of treatment of casing-head gasoline or the like may be carried out in a single operation and under very moderate pressure.

ORE CRUSHER AND CONCENTRATOR

No. 1,200,104. This invention is by Charles O. Haskell, of Los Angeles, Cal., assignor to Centrifugal Machinery Company of Los Angeles, Cal., a corporation of California.

This invention relates to crushing, pulverizing and concentrating machines, and more particularly to a machine of this nature especially adapted for handling ore in such fashion that it will be crushed, pulverized and separated, the concentrates being discharged at one point and the tailings at another point.

One of the objects of the invention is to provide a strong, substantial and very efficient and practical crushing and concentrating machine, which will readily handle ore in any form, and which will crush, pulverize and separate ore so that the concentrates may be discharged through one opening and the tailings and dust through another opening. A further object of the invention is to provide a machine in which many of the parts are both reversible and interchangeable, and a machine which may be easily assembled, and in which worn parts may be easily removed and renewed.

OPERATING AND RECLAIMING OIL-WELLS

No. 1,200,423. This invention is by William Daniel Huff, of La Fayette, La., assignor of three-fourths to Louise Guidry Moss, of New Iberia, La.

This invention relates to improvements in operating and reclaiming oil wells. It is the purpose of this invention to expedite the flow of oil in those wells in which the flow has already begun to diminish, and to reclaim those oil wells in which the flow has already ceased due to the thickening of the oil around the opening, owing to the presence of paraffin, or other causes.

According to this invention the interior of the well near the bottom, is heated with any hot fluid, for instance as air, which is preferably used in the regenerative way, and this heat not only serves to thin the oil in the veins, permitting it to flow from the oil bearing strata into the well, but also generates steam or other gas pressure in the well, which depresses the fluid in the well from the static head down to a point below a series of steam ejectors, carried by pipes mounted in the well, which add the dynamic effect of the ejector to the lifting effect of the pressure in the well, and thus lift the oil or other liquid in the well through the casing and deliver it to a delivery pipe.

EXTRACTING METALS FROM ORES

No. 1,200,832. This invention is by John C. Greenway of Warren, Ariz.

This invention relates to improvements in apparatus for extracting metals, preferably copper, from their ores by leaching in such a manner as to obtain a good extraction and at the same time maintain the solution low in impurities in order that the copper can be economically separated without further preparation or purification.

The chief object of this invention is to provide a means for leaching a series of bodies of ore, such that the leaching solution will be discharged from the last body substantially neutral, thereby requiring a minimum amount of acid and giving a very efficient extraction of the metal and at the same time to remove impurities from the solution, thereby facilitating the separation of the metal from the solution.

ROCK DRILL

No. 1,200,935. This invention is by August Gerdes, of Gretna, La.

This invention relates to rock drills and has particular reference to a drill which is adapted for use in boring oil and artesian wells and the like, but it will be understood that certain features of the same are adapted for use in rock drills generally.

The object of the invention is to generally improve this form of drills and provide a connection between the drill or bit and the drill head by means of which a wabbling motion as well as a rotary motion can be given to the drill. Such a motion is preferable when boring rock or other hard substances because when the drill strikes an obstacle it will not break or injure any part of the drill but will immediately begin to wabble and wear away the obstacle in this manner. The material loosened by the bit on the drill head is then flowed out of the well by water which is pumped in through the body of the drill.

ORE CONCENTRATING APPARATUS

No. 1,201,053. This invention is by Thomas A. Janney, of Garfield, Utah.

This invention has for its object the improvement of apparatus used in the concentration of ores by the oil flotation process, in which process the ore mixed with water in the form of a freely flowing pulp is agitated with oil and other reagents, if such are necessary or beneficial, with the result that the metalliferous part of the ore is caused to float when the pulp is removed from the zone of the agitation and permitted to assume a condition of substantial quiescence. This process can be carried out in many different forms of apparatus, but the apparatus forming the subject-matter of this invention possesses several distinct and novel advantages.

MINE CAR

No. 1,199,794. This invention is by Warren V. Johnson, of Bloomsburg, Pa., assignor to American Car and Foundry Co., of St. Louis, Mo., a corporation of New Jersey.

According to this invention a mine car should be light, strong and durable, possessing inherent qualities of elasticity to adapt it to resist service shocks, and it should be so fashioned that it can be readily repaired in such parts where repairs are most frequently required.

For the bituminous regions it has been found advisable to employ wood in cars, particularly in mine cars, and the present invention contemplates the employment of wood flooring extending through and beyond the body portion to form end bumpers of a composite type comprising the portions of the floor which extend beyond the body cooperating with wood bumper blocks and end bumper bands of metal which fit over the ends of the floor and bumper blocks.

PROCESS OF DISTILLING PETROLEUM

No. 1,199,463. This invention is by Altis S. Hopkins, of Neodesha, Kans., assignor to the Standard Oil Company, of Neodesha, Kans., a corporation of Kansas.

This invention relates to the art of distilling mixed liquids. The invention is especially concerned with the destructive distillation or cracking of relatively heavy or high boiling point hydrocarbon oils to produce therefrom lighter or lower boiling point products, as carried out, for instance, according to the method disclosed in the patent to William M. Burton, No. 1,049,667, of January 17, 1913.

Report Soon on Georgia Kaolin

A paper on Georgia kaolin by Ira E. Sproat will be published within the next few weeks by the Bureau of Mines.

RAILROADS ARGUE COAL CASE BEFORE SUPREME COURT

A series of briefs for defendants in the so-called Reading and Lehigh Valley coal trust suits, denying the Government's charges that monopolization of production and transportation of anthracite coal has been effected by these companies in their respective territories, have been filed in the Supreme Court. The cases were argued before a full bench.

The Reading Company and the Central Railroad of New Jersey declare in their briefs in the Reading case that only about 20 per cent of the anthracite trade they are charged with monopolizing, actually is controlled by them, and denied that any question of restraint of trade was involved in Reading's acquisition of a majority of the stock of the Jersey road in 1901.

In the Lehigh Valley case briefs were filed by the Lehigh Valley Railroad, the Lehigh Valley Coal Company, the Lehigh Valley Sales Company, the G. B. Markle Company and individual defendants. Conceding that stock of other coal companies was acquired by the Lehigh road to protect its anthracite tonnage, they asserted that this was done in furtherance and not suppression of coal competition.

Competition of the Reading, Erie, Delaware and Hudson and Lackawanna interests, it is declared, made necessary, with the approval of the State of Pennsylvania, the acquisition of coal properties.

"At the present time," said the Lehigh road's brief, "the Lehigh Valley Coal Company owns, or controls, but 10.3 per cent of the total anthracite acreage in the three contiguous regions in Pennsylvania—the Wyoming, Lehigh and Schuykill—and but 22.3 per cent of the acreage naturally tributary to the Lehigh Railroad. That is not monopoly."

It is asserted that coal transportation has become vital to continued existence of the Lehigh Railroad. Defending acquisition of the Delaware, Susquehanna and Schuylkill Railroad, the Lehigh Company's brief asserted that there was little competition between them.

DEATH CLAIMS TOWERING FIGURE IN MINING WORLD

Adolph Zang, for years president of the Vindicator Consolidated Mining Company, of Cripple Creek, Colo., died at his home in Denver, September 28.

Mr. Zang was a member of the American Mining Congress and was deeply interested in its work. He was one of a group of investors whose faith in the future of Colorado's mining industry did not falter during its darkest days.

It was due to men like Zang, Campbell and Sigel, all now gone to the Great Beyond, that capital continued to flow into Western mining channels. They all were rewarded amply for their faith. Two years ago Mr. Zang and his associates were responsible for one of the largest mining consolidations in the Cripple Creek district.

Latest Traffic Developments

In case No. 7176 before the Interstate Commerce Commission, the Tennessee Copper Company *vs.* Southern Railway Company, the decision is summarized as follows:

1. Rates for the transportation of nitrate of soda in carloads from Charleston, S. C., and Savannah, Ga., to Copperhill, Tenn., found unreasonable, and reasonable maximum rates prescribed for the future.
2. Rates for the transportation of nitrate of soda in carloads from Pensacola, Fla., and New Orleans, La., to Copperhill, Tenn., not found unreasonable or unjustly discriminatory.
3. Rate of 82 cents per 100 pounds for the transportation of nitric acid in carloads from Great Falls, S. C., to Copperhill, Tenn., not found unreasonable.
4. Rate of $1.80 per ton for the transportation of coke in carloads from Josephine and Dorchester Junction, Va., to Copperhill, Tenn., not found unreasonable.
5. Rates for the transportation of lumber, logs, poles, and crossties in carloads from Murphy, N. C., and Ellijay, Sweet Gum, and McCullough, Ga., to Copperhill, Tenn., not found unreasonable.
6. Rates for the transportation of lead dross and pig lead in carloads from Copperhill, Tenn., to Baltimore, Md., and other points, mentioned in the report, and for the transportation of sheet lead in carloads from Baltimore and some of such points to Copperhill, not found unreasonable.
7. Rates for the transportation of pig lead in carloads from Copperhill, Tenn., to Atlanta, Ga., and for the transportation of sheet lead in carloads from Atlanta to Copperhill, found unreasonable, and reasonable maximum rates prescribed for the future.
8. Rates for the transportation of copper bullion in carloads from Copperhill, Tenn., to Baltimore, Md., and Perth Amboy, N. J., and to certain Virginia and south Atlantic ports mentioned in the report, not found unreasonable or unjustly discriminatory.
9. Rates on interstate shipments of coal in carloads from groups A, B, and E, on the line of the Louisville & Nashville Railroad Company, to Copperhill, Tenn., not found unreasonable or unjustly discriminatory.

St. Louis Rate Upheld

In the case No. 7649 of the Coal Operators' Traffic Bureau of St. Louis *v.* Baltimore & Ohio Southwestern Railroad the Interstate Commerce Commission found that the rate charged for the transportation of bituminous coal from group 2 points in Illinois to St. Louis, is not unlawful.

Drawback Allowed

Drawback has been allowed under paragraph O of section 4 of the tariff act of October 3, 1913, and the drawback regulations (chapter 18 of the Customs Regulations of 1915) on metal powder manufactured by the Nassau Smelting & Refining Works, of New York, N. Y., with the use of imported antimony.

EFFORTS OF EDITOR IMPROVES GRADE OF TECHNICAL COMPOSITION

Most commendatory reference is being made throughout the country to the revised edition of "Suggestions to Authors" by George McLane Wood, editor of the Geological Survey.

During his many years' service with the Geological Survey, Mr. Wood has been laboring tirelessly to reduce scientific writings to an easily understandable plane. In addition he has done a great deal to increase the literary standing of the scientific papers which the Survey is issuing continually.

Formerly, perhaps more than at the present, the criticism was heard frequently that many scientific writers have a poor literary style. In addition scientific writers are continually tempted to fall into the use of technical terms and expressions which greatly limits their field of readers. In endeavoring to overcome this objection Mr. Wood is credited with having done a very remarkable service to the Survey and to those in whose interest its work is done.

Instructors in English and writers of note are among those who have written the Director of the Geological Survey complimenting the Bureau and Mr. Wood on the excellence of this latest publication. Frank H. Vizetelly, managing editor of the Standard Dictionary, says in part: "It is a treatise which I prize highly for never have I seen one which treats the subject so ably and comprehensively." Brander Matthews, the celebrated writer who resides in New York City, says, "Your 'Suggestions to Authors' are excellent." A long list of other persons including U. P. Hedrick of the New York Agricultural Experiment Station; Charles C. Adams of the New York College of Forestry; Prof. Chas. B. Berkly of the Columbian University and Jos. Hyde Pratt, the State Geologist of North Carolina, have made complimentary reference to the work.

DEVELOPMENT OF WATERPOWER CURTAILS USE OF ALABAMA COAL

In ordinary times Alabama supplies a large quantity of coal for steamship bunkers at Pensacola, Mobile, Gulfport, and New Orleans; but since the European war began there has been little call for coal for that purpose at those ports. The development of water power on a large scale in Alabama has also cut off the market for a large quantity of coal. The opening of Warrior River to navigation was expected to offer an outlet for large quantities of coal to New Orleans and Mobile ports, but in 1915 there was no demand from those sources and a comparatively small quantity of Alabama coal found markets over that waterway.

J. C. McDOWELL

Who will speak on "Geology in its Relation to the Oil Industry"

POTASH BEING PRODUCED AT VARIOUS PLACES

Production of potash in commercial quantities is in progress near Marysvale, Utah. It is being produced also from the alkali lakes of Nebraska. It is obtained as a by-product in the manufacture of Portland cement at Riverside, Cal. It is taken from the brines of Owens Lake, Cal., and secured from kelp along the Pacific Coast.

Production in the near future from various other sources is frequently promised and experiments are continually being made. One line of experiments which has been attracting considerable attention for some time is the extraction of potash from feldspathic rocks. Chemical engineers interested in this phase of the subject are of the opinion that feldspathic rocks containing from 10 to 12 per cent potash may be utilized to advantage eventually, but at the present time there has been no process perfected for such extraction in commercial quantities.

Potash salts, which before the European war sold for about $40 per ton, now bring in the neighborhood of $500.

ALTITUDE OF CALIFORNIA OIL FIELD RUNS UP TO 3,000 FEET

The altitude of oil wells in California varies greatly, the range being from sea level to 3,000 feet above it. The depth of the wells also varies, depending upon the structure of the oil sands, that is, the way those sands are bent and not upon the position in the State. The depth varies from a few feet to as much as 5,000 feet.

The Lakeview well, which was the largest well ever brought in in California, has an altitude above sea level of about 700 feet, and was drilled to a depth of about 2,200 feet.

The altitude of the surface in the oil fields of Texas ranges from a few feet along the coast to about 1,000 feet in the northern part of the State, and nearly 1,500 feet in Palo Pinto and Shackleton Counties. The depth of producing wells ranges from 200 or 300 to about 3,000 feet.

Oil wells in the vicinity of Olean, N. Y., vary in altitude from about 1,550 feet on the head of Fourmile Creek to above 2,300 feet at Rock City and Flatiron Rock. It is believed that the oil-bearing sand is the Bradford and that the depth, varying with the location of the wells, is 1,200 to 2,200 feet.

DR. HENRY MACE PAYNE

Who will give an illustrated lecture on "Frozen Gravels in Alaska nnd Siberia"

PLATINUM SURPRISE DUE SOON, IT IS CLAIMED

A very important development in the platinum situation is expected shortly. Those who are acquainted with this industry in South America declare that a surprise is certain to come very soon. As yet the matter has not ripened sufficiently to justify publication, they claim.

Platinum experts are having difficulty in explaining the recent decrease in the price of platinum. Some are of the opinion that so much uncertainty surrounds the platinum market that the arrival of an unusually large shipment from South America sent the prices off for the time being.

Dr. Parsons on Government Mission

Dr. Charles L. Parsons, chief of the division of Mining Technology of the Bureau of Mines, sailed October 6 for Europe to make an investigation of nitrate plants. This investigation is being made in preparation for the erection of a nitrate plant by the United States Government.

R. W. Pack of the Geological Survey has gone to California on an oil investigating trip.

George H. Wigmore, of Los Angeles, has been in the East recently gathering information as to the possibility of marketing low-grade tungsten ores.

A. C. Veatch, an American geologist connected with the Aguila Oil Company, was in Washington recently. Mr. Veatch is regarded as one of the foremost American oil experts. He is an authority on oil occurrences in Algiers, Morocco, and other countries in northern Africa.

D. F. Hewett, of the Geological Survey, is in Wyoming finishing up a report on the Big Horn Basin.

B. S. Butler, of the Geological Survey, returned from several months' work in the Cottonwood lead and silver district of Utah. A detailed examination of this region is under way.

Harry S. Coe, of the Dorr Machinery Company, was in Washington recently. He is engaged in chemical experiments in New York at present. Mr. Coe is well known in mining circles in Mexico and Central America.

F. W. Clarke, chief chemist of the Geological Survey, has returned from Maine where he has been conducting some investigations.

B. Bryan, a well-known geologist, is en route to Argentina where he will conduct some investigations in the northwestern portion of that country.

The Controlled-key
Comptometer
Adding and Calculating Machine

We extend to the members and guests of the Nineteenth Annual Convention of the American Mining Congress a cordial invitation to visit the Factory of the COMPTOMETER ADDING and CALCULATING MACHINE.

We esteem it a privilege to show visitors through the plant and will appreciate your acceptance of this invitation.

Our automobiles leave at frequent intervals for the Factory from our City Office at 14 S. LaSalle Street (half a block south of Hotel LaSalle) where visitors are invited to call and register before starting.

FELT & TARRANT MANUFACTURING CO.
1713-1735 N. Paulina St., Chicago

World's Largest Electric Shovel Strips Overburden From Coal

At Smithfield, Ohio, the Piney Fork Coal Company strip the overburden from their coal with a 6-yard electric shovel, operated by purchased electric power from Wheeling, W. Va., a dozen miles away. G-E Motors and Control equipment are used exclusively.

The economy and certainty of power resulting has permitted uninterrupted operation through the coldest weather.

Two electrical equipments for 8-yard shovels have been sold as a result of the splendid satisfaction given by the 6-yard shovel. These shovels are operated by one man and are both roomy and clean thus promoting safety of operator.

General Electric Company

General Offices: Schenectady, N. Y.

District Offices in:

Boston, Mass.
Cincinnati, Ohio
San Francisco, Cal.

New York, N. Y.
Chicago, Ill.
Atlanta, Ga.

Philadelphia, Pa.
Denver, Colo.
St. Louis, Mo.

Sales Offices in all Large Cities.

6304
MARION SHOVEL—MODEL 271—ELECTRIC

6 cubic yard Electric Shovel,
Piney Fork Coal Co.,
Smithfield, Ohio

THE
MINING CONGRESS
JOURNAL

SAFETY—EFFICIENCY—CONSERVATION

VOL. II

No. 12

DECEMBER, 1916

Walter Douglas

Elected President of the American Mining Congress at the Annual Convention held last month.

PUBLISHED BY
THE AMERICAN MINING CONGRESS
PUBLICATION OFFICE
MUNSEY BUILDING WASHINGTON, D. C.
$ 2.00 PER YEAR
20 ¢ PER COPY

AWARDED

PANAMA PACIFIC GRAND PRIZE INTERNATIONAL EXPOSITION

Americore

RUBBER COVERED WIRE

for INTERIOR WIRING

ALL SIZES AND VOLTAGES

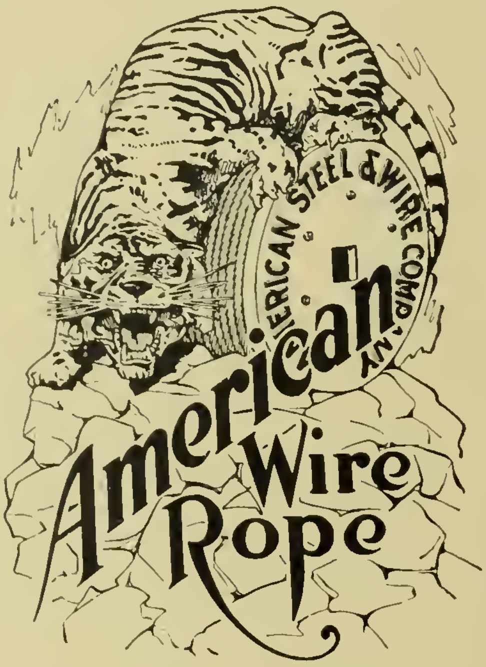
Every coil examined and labeled under the direction of the underwriters laboratories. Ignition wire for autos. motor boats and aeroplanes. *Send for booklet fully describing.*

American Steel & Wire Company's
Amerite
RUBBER COVERED AND SIGNAL
Wires
THE HIGHEST ATTAINMENT OF INSULATION PERMANENCE

We present these wires as the result of many years of exhaustive research and test under service conditions, assuring the greatest efficiency over the longest period of usage.

The specifications of this wire are adequate for the most extreme requirements of indoor use in high-class structures as well as for the most exacting outdoor exposure.

Send for Booklet fully describing.



For elevators, dredges, lumbering, mining, oilwell drilling, suspension bridges, stump pulling, cranes, derricks, shovels, rigging and every other form of wire rope use.

Ask for illustrated catalogue.

Read about wire rope usage in its different requirements in American Wire Rope News. Gladly sent free to anyone upon request.

AWARDED

PANAMA PACIFIC GRAND PRIZE INTERNATIONAL EXPOSITION

Supreme Award of Merit

Made by

American Steel & Wire Company

Chicago **New York** **Cleveland**
Pittsburgh **Worcester** **Denver**

Works: WISSINOMING, PHILADELPHIA, PA.

Manufacturers of High Grade Mechanical Rubber Goods

IRONSIDES Rubber Belt for transmission purposes.
DESERT Rubber Belt for conveying ore.
EBONITE Steam Hose, EBONITE Air Drill Hose, QUAKER CITY and CROWN Water Hose
DANIEL'S P. P. P. ROD PACKING and EBONITE SHEET PACKING PUMP VALVES, MOULDED GOODS, ETC.

Send for our new catalog F-5. Hundreds of illustrations with complete description on above and many other articles used in the Mining Industry. Every mining office should have a copy. Write today using the letterhead of your company.

QUAKER CITY RUBBER COMPANY

PHILADELPHIA CHICAGO PITTSBURGH NEW YORK

EDMUND B. KIRBY
Mining Engineer and Metallurgist
918 Security Bldg., St. Louis
Specialty: The expert examination of mines and metallurgical enterprises.

ELI T. CONNER
Mining Engineer "Coal"
Specialty: Managerial Consultation on Coal Mining
28 Liberty Street
NEW YORK, N Y.

JOHN D. FIELDS
Mining Engineer
Designing and Constructing Copper Leaching Plants a Specialty
MAXVILLE MONTANA

SEELEY W. MUDD, *Mining Engineer*
1208 Hollingsworth Building Los Angeles, Cal.
Code: Bedford McNeill

Cable Address Usual Codes
Macepayne" New York
HENRY MACE PAYNE
Consulting Mining Engineer
Woolworth Building NEW YORK

RUHL & STEWART
Mining Engineers
JOPLIN MISSOURI

HARRIS-STEVENS COMPANY
Engineers, Designers, Manufacturers, Modern Mine Cars
First National Bank Bldg., PITTSBURGH, PA.

Thomas Marioneaux B. N. C. Stott Clarence M. Beck
MARIONEAUX, STOTT & BECK
Attorneys and Counselors
Mining Law and General Practice
405-6-7 Kearns Building SALT LAKE CITY

TOUT & McCARTHY, Butte, Mont.
Assayers and Chemists
Assays, Analysis and Tests, Independent Control Work

Cable Address, "Consultoil" Code, Bedford McNeill
THE ASSOCIATED GEOLOGICAL ENGINEERS
F. G. CLAPP and M. L. FULLER
Managing Engineers
Examinations and Reports on Mineral Properties
Specialists in Oil and Gas Problems
120 Broadway........................NEW YORK CITY
131 State St........................BOSTON, MASS.
1333 F St........................WASHINGTON, D. C.
331 Fourth Ave........................PITTSBURGH, PA.

Herbert Goodall Archie J. Goodall
GOODALL BROS., *Assayers and Metallurgists*
Smelter Shipments Checked Controls a Specialty
38 South Main Street, HELENA, MONTANA

H. N. LAWRIE
Consulting Mining Geologist
526 Yeon Building
PORTLAND OREGON

L. D. Bell Phone, Cable "Rolyat,"
1201 Grant W. U. Code
SAM'L A. TAYLOR, C. E.
M. Am. Soc. C. E. M. Am. Inst. M. E.
Consulting, Civil and Mining Engineer
506-509 Second National Bank Bldg.
PITTSBURGH, PA.

WM. GRIFFITH
Mining Engineer, Geologist
COAL EXCHANGE, SCRANTON, PA.
Specialty—COAL. Careful Reports, Estimates, etc.
Interviews by appointment, New York or Philadelphia

Irvington Smelting and Refining Works
Buyers, Smelters and Refiners of Gold, Silver, Lead, Copper and Platinum Ores, Sweeps and Bullion
Manufacturers of Copper Sulphate
IRVINGTON :: :: :: NEW JERSEY
N. Y. OFFICE—Charles Engelhard
Hudson Terminal Building 30 Church Street

19th Annual Banquet
American Mining Congress
Hotel La Salle Nov. 16, 1916
Chicago
Kaufmann Fabry Co.
Chicago
16-8965

MINING CONGRESS BANQUET, NOVEMBER 16

VOL. 2, NO. 12 WASHINGTON DECEMBER, 1916

THE MINING CONGRESS JOURNAL

Official Organ of the American Mining Congress

NINETEENTH CONVENTION PROVES BIG SUCCESS

Never before, in the nineteen years during which the American Mining Congress has been in existence, has the future been so promising. At the convention held last month in Chicago, there was such unmistakable evidence of general appreciation of the work that the Mining Congress is doing that more effective endeavor in the future is certain.

As with all cooperative organizations, the strength of the Mining Congress is judged by the nature of the support given it. When the busiest of busy men will travel long distances and take valuable time away from their own businesses to join in a convention, it is absolute proof that their hearts are in the organization of which they are members.

Any tendency toward apathy on the part of the membership of a cooperative organization robs it of its ability to accomplish. With the knowledge that the most active and the most representative men in the mining industry are enthusiastic supporters of the Mining Congress and its work, the prestige enjoyed by the organization is increasing to the point where it has weight with the public and with those who make the laws.

SALARY SCALE OF 50 YEARS AGO NO LONGER ADEQUATE

Private enterprise is helping itself with alarming repetition to the trained men in the Government service. As the ranks thin, the difficulty of replacement with men of the same grade grows greater. Uncle Sam has not done much revising of his salary scale since the Civil War. The public interest can be served best if the remuneration, especially in the technical service, is made sufficiently attractive to enable the Government to have first choice of the more competent.

WALTER DOUGLAS WELL KNOWN TO MINING MEN

Walter Douglas, the newly elected president of the American Mining Congress, needs no introduction to the mining industry. He is one of those busy men who finds time to do work for the public good. With his administrative genius, devoted in part to the work of the Mining Congress, it is certain that there will be no interruption in the important work which the Congress has been doing.

BALANCED ATTENDANCE DIFFICULT TO SECURE

Some emphasis has been placed in certain quarters, on the fact that the metalliferous portion of the mining industry was not represented at the Chicago Convention of the Mining Congress in proportion to the representation of the coal mining industry. While it is true that there were more coal mining men present at the recent convention, there is nothing surprising about it. A convention is certain to be attended more largely by those representing mining activities in adjacent territory. When a convention of the American Mining Congress is held in the West, metalliferous miners greatly outnumber the representatives of the coal mining industry.

Considering the very active state of the mining industry, it is really a matter of surprise that so many mining men were able to attend. This is especially true with regard to the metal miners as they had such long distances to travel. The American Mining Congress is not controlled or influenced by any one class of mining men. It is working just as actively in the interest of the metal miners as it is in the interest of coal miners.

EXHIBITORS ADD TO SUCCESS OF CONVENTION

Just as generous purchases of advertising space enabled us to print a more representative journal in November, the exhibitors at the Mining Congress Convention added materially to the success of the Chicago meeting. In another column a complete list of the exhibitors will be found.

As most of the exhibitors took enough orders during the convention to more than pay for the expense and trouble, they expressed themselves as being more than satisfied, but even if no single order had been secured, an exhibit at such affairs as the Mining Congress Convention is a certain indication of enterprise that does much to enhance prestige. It impresses many a potential buyer whose order may not be placed for a considerable interval.

ANTAGONIZES NONE, IS LOVED BY ALL

That a degree of affection, stronger than realized by most of us, exists among Mining Congress members for Carl Scholz, who just has retired from the presidency of the organization, became very evident at the recent convention. The watch which was given Mr. Scholz, while of considerable intrinsic value, was entirely inadequate to represent the esteem in which he is held by the donors.

Mr. Scholz is one of those men so filled with the milk of human kindness that he unknowingly excites a degree of affection that is uncommon. His personality is one that antagonizes none.

Mr. Scholz, a foreigner by birth, who knew no English until he already was an adult, has overcome the extraordinary number of obstacles which beset the path of a stranger in a strange land, and has left his imprint, deeply dented, in the affairs of one of the greatest American industries. For three terms he was president of one of the nation's greatest cooperative organizations. He has done much to draw mine operators into a closer relationship that is making for the advancement of the industry. He has done a great deal to cause the wage earner and the general public to cast aside prejudicial suspicions which so often have prevented them from joining hands with the mining operator for the common good.

SHORTAGE OF LABOR FOUND IN SOME MINING DISTRICTS

H. C. McCaskey, chief of the mineral resources division of the Geological Survey, has returned from a trip to the three western offices of the Survey at San Francisco, Salt Lake City and Denver. This trip was made in connection with the work of the current fiscal year. Mr. McCaskey, in addition, visited some new quicksilver prospects near Morton, Wash., and Gold Hill, Oreg.

Mr. McCaskey reports that besides the activity among those prospecting for quicksilver there is also much interest shown in magnesite, manganese and many other of the rarer metals, which have become especially important since the outbreak of the war. In some of the regions he visited, Mr. McCaskey found a shortage of labor.

DR. WHITE FIRST PROMULGATED THE ANTICLINAL THEORY

"The anticlinal theory was first promulgated by Dr. I. C. White, about 1880. It is a theory to explain the accumulation of oil and gas in large quantities. From a study of the distribution of oil and gas pools in relation to geologic structure, he discovered that the production was generally found associated with anticlines or earth folds. The anticlinal theory of oil and gas accumulation reulted from an attempt to explain this relation, and also to explain the relation of oil, gas and salt water, which were observed to occupy definite positions in the anticline. Gas, the lightest substance, being in the upper part of the anticline; oil, the next heavier, below the gas, and beneath the oil, the salt water." (Extract from the addresss of J. C. McDowell at the Mining Congress Convention.)

NINETEENTH ANNUAL CONVENTION OF MINING CONGRESS WAS GREAT SUCCESS

Walter Douglas, of Phelps, Dodge & Company, is Elected President—Mining Congress Gets Squarely Behind Western Idea of Conservation after Fight is Staged in Resolutions Committee—Attendance Large

A decided stride toward uniform legislation covering coal mining; a clearer understanding of the obstacles which must be met before limited cooperation between coal companies may be effected; a more determined desire for a uniform cost accounting system and an unequivocal announcement in favor of the western idea of conservation were among the important results of the nineteenth annual convention of the American Mining Congress, which was held in Hotel La Salle, Chicago, November 13 to 16. Walter Douglas, of the Phelps, Dodge Co., was elected president of the Congress for the ensuing year. The place of the next meeting has not been selected. Birmingham, Ala., Pittsburgh, St. Louis and Duluth are being urged strongly.

That the mine operators of the country are more eager than ever before to cooperate not only among themselves, but with their employes and all other interests with which they come in contact was made very evident. The dog-eat-dog policy, which has been so much in evidence in the mining industry in the past, has become decidedly unpopular, the convention showed. Operators and wage-earners are making their conduct conform more and more to the golden rule, as was so clearly shown by the attitude of their representatives at this convention.

The convention from start to finish was a success. The coal section and uniform mining legislation section accomplished more than anyone had anticipated. The oil section developed into a meeting of greater importance than had been expected. In putting through L. W. Trumbull's public land resolution, a great victory for the western idea of conservation was scored. It will be recalled that a similar resolution had failed to pass at a previous session of the American Mining Congress. It was not accepted by the Resolution Committee at this convention until several hours of acrimonious debate had taken place.

There was some disappointment in the metalliferous section. The attendance of the metal mining men was comparatively small. Several of those who were to have presented papers before this section were prevented at the last moment from being present. Despite the handicaps several interesting sessions of this section were held and much benefit was reported, especially by those who were interested in flotation and in the zinc industry. Due to the great demands for metals few of the operators could spare the time to journey to Chicago for the convention. The place of the meeting, of course, was not centrally located for metal miners, and this had considerable bearing on the matter of their attendance. Even with Chicago centrally located with regard to the coal mining fields, many of the operators were so busy as to be unable to attend at all. Many others came to Chicago for a single day only, but with it all the convention was largely attended and there was nothing left to desire in the spirit manifested.

While the Mining Congress found it impossible to cooperate with the Uniform Mining Legislation Section to the extent that was desired, it is believed that the Mining Congress will be able to forward this work by close cooperation with a separate association which grew out of the Mining Legislation Section. This section resolved itself into The Uniform Mining Laws Association. A. J. Moorshead, of the Madison Coal Corporation of Chicago, was elected president of the new association. Robert Harlin, of the International Executive Board of the United Mine Workers of America, was elected vice-president, and J. G. Grossberg, of the Illinois Mining Investigating Commission was made secretary and treasurer. The resolution which was presented by the Uniform Mining Laws Association, which the American Mining Congress found impossible to pass, reads as follows:

"Whereas the Conference on Uniform Coal Mining Legislation called by Governor Dunne, of Illinois, has requested that the American Mining Congress join in the appointment of a Commission which in cooperation with the Bureau of Mines, shall codify the coal mining laws of the various coal producing States, and prepare a fundamental law to be presented to the legislators of the several coal mining States; and has also requested that the Mining Congress use its influence in securing for the Bureau of Mines an appropriation from the United States Congress to defray the expenses of such a Commission, and,

"Whereas, the American Mining Congress believes the object sought is a matter of great importance, but considers that the codifying of said laws and the preparation of a fundamental law can best be accomplished by the Bureau of Mines rather than by a Commission which could not be representative of the coal mining industry of the entire country.

"Therefore, be it resolved, that the secretary of the American Mining Congress be requested to prepare a bill for presentation to Congress of the United States authorizing the Bureau of Mines to codify the coal mining laws of the several States and providing an appropriation necessary for carrying out the provisions of the act; and, further authorizing the Bureau of Mines to prepare the preliminary draft of such uniform coal mining law for presentation to the legislatures of the several States."

After the Uniform Mining Laws Association was formed it adopted this resolution:

It is the sense of this organization that a commission of Uniform Coal Mining Legislation be selected to consist as follows: Three coal miners to be appointed by the International Executive Board of the United Mine Workers of America; three coal operators to be appointed by the American Mining Congress; and three members, no one of whom shall be identified or affiliated with the interests of either coal mine owners or coal miners or dependent upon the patronage or good will of either, to be appointed by the Secretary of the Interior as soon as he has been notified of the appointment of the miners' and operators' representatives; the Director of the Federal Bureau of Mines to be an ex-officio member of the Commission.

The duties of this Commission shall be to draft and report to the next annual meeting of this organization, a tentative code of uniform coal mining laws to be recommended for adoption to the legislatures of the several coal mining States.

We earnestly request Congress to appropriate the requisite funds to the Federal Bureau of Mines for the purpose of cooperating in carrying on the work of the Commission.

RESOLUTIONS WHICH WERE ADOPTED AT CONVENTION

The resolutions adopted by the American Mining Congress Convention give an idea of the importance of some of the matters which were under discussion. The more important resolutions adopted follow:

PUBLIC LANDS

This resolution was introduced by L. W. Trumbull, state geologist of Wyoming:

Whereas, the increasing expense of courts, schools, asylums, hospitals and other State institutions, the building and maintenance of roads, and the administration of law over its whole area, cannot be supported by a tax levied upon less than one-half of the area of the several States without undue and unfair burden; and,

Whereas, the policy laid down by Abraham Lincoln that "The public lands are an impermanent national possession held in trust for the maturing States," and the liberal administration of laws framed to make such policy effective have worked great advantage to the West and to the nation; and,

Whereas, the recent restrictive administration of the public laws and the efforts to make more difficult the acquisition of title to mineral and other public lands in the West have been largely instrumental in preventing settlement, in restricting development and hampering the progress of the mining industry and preventing it from keeping pace with industrial advancement in other lines of effort; and,

Whereas, the proposed policy for the Federal leasing of mineral and other lands will keep from the State taxing power valuable property, which should contribute to the support of State institutions, will prevent investment, restrict development, foster monopoly in the hands of those who have already acquired title to the public domain and make necessary a system of Federal control and espionage subversible of free institutions, expensive of administrations and repugnant to the feelings of a free people, therefore, be it

Resolved, that we urge upon the Department of the Interior of the United States, a more liberal administration of our public land laws, that we disfavor the adoption at this time of any system of Federal leasing of mineral and other lands, or the enactment by Congress of any laws relating to public lands having a tendency to restrict the development of the West.

UNIFORM ACCOUNTING

Carl Scholz introduced this resolution:

Whereas, the information which the Federal Trade Commission has acquired within the time of its existence, has placed it in possession of data and other information on costs which will enable it to do much toward the improvement in conditions of the employes, aid the mine owners and at the same time subserve the interests of the public, and

Whereas, the American Mining Congress recognizing the many difficulties which confront the mining industry and believing the conservation of life and mineral resources are vital to the welfare of the nation;

Therefore, be it resolved, that we recommend that the Congress of the United States be requested to enact such legislation and make such appropriation as will enable the Federal Trade Commission to devise uniform systems of accounting applicable to the different branches of the mining industry.

AS TO OIL LANDS

Former Governor J. N. Gillett, of California, introduced this resolution:

Whereas this Congress is deeply interested in the just operation of the mining laws and,

Whereas as a result of certain land withdrawal orders by the President of the United States and of legislation by Congress, many persons who at great expense, and, as adjudged by the courts, have in good faith, developed the oil lands of the country, are threatened with ejectment and forfeiture of their developed lands and their investments;

Therefore be it resolved, that in all such cases we urge prompt and appropriate legislative relief so that those who have in good faith developed such lands shall be protected.

FOR INCREASED SAFETY

T. L. Lewis, former president of the United Mine Workers of America, introduced the following resolution:

Whereas, in mine safety work, one of the most serious problems encountered, is the lack of personal cooperation on the part of some operators and also on the part of some miners, thus preventing the success of the work of promoting mine safety and reducing the number of accidents and fatalities in the mining industry, and

Whereas, while much has been accomplished it is believed to be vastly important that every possible agency looking to greater safety in mining operations shall be enlisted and that efforts be made to secure the active cooperation of those agencies which thus far have not voluntarily given their best support to the movement.

Now, therefore, be it resolved, that a committee of seven be appointed, which shall investigate this important subject and report its findings and recommendations to the next annual convention of the American Mining Congress.

AS TO LAW REVISION

The Denver Civic and Commercial Association introduces the following resolution:

Whereas, as the Federal mining laws now in force have resulted in controversy, litigation and expenses together with the retardation of mining development during long periods of litigation, as exemplified in all mining districts where these laws are enforced; and,

Whereas, a notable effort has been made by the American Institute of Mining Engineers and the Mining and Metallurgical Society of America and the American Mining Congress to secure comprehensive, intelligent investigation of the conditions that have arisen from evils in the existing Federal statutes; and,

Whereas, the situation is one so complicated that a thorough and intelligent investigation is an essential preliminary to the modification of the mining laws;

Therefore, be it resolved, that the American Mining Congress heartily concurs in and subscribes to the movement to bring about such an investigation by a competent, nonpolitical commission, to be appointed by the President of the United States, and to consist of three men, all of whom shall serve without pay; one of the commission to be a mining attorney, another a mining engineer, and the third a prominent mine owner; all of whom shall be thoroughly familiar with the defects in and the operation of the present mining laws. This commission, after thoroughly investigating the defects of the present law, shall formulate the necessary remedial legislation for the benefit of Congress, and hold itself an advisory body during the consideration of such legislation by Congress.

WOULD BETTER SERVICE

The following resolution was introduced by the Uniform Legislation Section:

Whereas, any law is only as useful as its enforcement. The safety of many thousands of lives and many millions in property is dependent upon a proper enforcement of the mining laws.

Therefore, it is the sense of the American Mining Congress that the mine inspection service, like the Army and Navy, and police and fire departments, should be scrupulously and rigidly kept out of politics.

In view of forthcoming changes of administration in a number of States, the press is requested to give this resolution the widest possible publicity.

WATER POWER

Judge Frank H. Short introduced the following resolution:

Whereas, conflict of laws and jurisdiction covering the development of water powers in the United States, makes the use of vast undeveloped water powers commercially difficult if not impossible, be it

Resolved, that it is the sense of the American Mining Congress in meeting assembled at Chicago, Ill., November 18, 1916, that the Government of the United States of America and the several States be urged to enact such laws and regulations as shall facilitate to the greatest degree and safeguard, the utilization of existing undeveloped water powers for industrial and domestic purposes, thus conserving and permitting the developing of our natural resources, and be it further

Resolved, that such laws should encourage and permit development of this resource and all of the other resources of the public land states without discrimination and under laws and conditions in all respects as favorable as those applicable in the States having no public lands, and be it further

Resolved, that copies of this resolution be transmitted to Congress, the legislatures of the States and the Government and State departments having present jurisdiction.

Many of the mining men who attended the convention declared they were repaid for the expense and loss of time occasioned by the trip by the opportunity offered to look over the commercial exhibits. Many of the leading supply houses had attractive displays of their products on one of the floors of the Hotel, which was given over to the convention.

Those who had exhibits are: Haggard Marcusson Co., Chicago; R. & J. Dick, Limited, Chicago and Glasgow; Central Foundry Co., Chicago; State of Arizona; Roebling, Chicago and Trenton; Goodman Mfg. Co., Chicago; General Electric, Chicago; Justrite, Chicago; Macomber & Whyte, Chicago; Link Belt, Chicago; Miller, Earle & Miller, Chicago; Ameling Core Drill Co., St. Louis; Monroe Calculating Machine Co., Chicago; Electric Storage Battery, Philadelphia; Tool Steel Gear & Pinion Co., Cincinnati; Florida Oil Flotation, Pensacola; U. S. Bureau of Mines; E. Christman, Massillon, Ohio; Draeger Oxygen Appliance Co., Pittsburgh, Pa.; Coal Age and Engineering and Mining Journal, New York; Stromberg Carlson Co., Chicago; Vulcan Fuel Co.; American Mine Door Co.; Sullivan Machinery Co.; Mining World Siebe Garment Co., H. N. Elmer, Agent; J. D. Fate Co., Plymouth, Ohio; Carbic Mfg. Co., Duluth, Minn.

When announcement was made that a memorial volume devoted to observation on the life and work of Dr. Joseph A. Holmes, had been published, numerous tributes to the late director of the Bureau of Mines were called forth.

Attendance at the convention was well above the average. The interest was unusually keen. The convention was divided into sections and much more was accomplished at this meeting than at any previous assemblage of the Mining Congress. In addition to the general session each day there were meetings of the Uniform Mining Legislation section, coal section, oil and gas section, metalliferous section and the public lands section.

Extracts from many of the papers which were read at the convention appear as separate items throughout this number of the JOURNAL.

BUREAU OF MINES LOSES TWO PROMINENT MEN

Two prominent members of the staff of the Bureau of Mines have tendered their resignations recently that they may accept private employ. W. A. Williams, chief of the petroleum technology division is to become assistant to the general manager of the Empire Gas & Fuel Company, of New York. Mr. Williams will be stationed at Bartlesville, Okla. His resignation takes effect January 1, 1917. Mr. Williams' salary with the Bureau of Mines is $4,800. Karl L. Kithil, who was designated a short time ago to take charge of the Tucson mining station, has resigned to go with Schlesinger radium interests. His office will be in Denver. The salary attached to the Tucson station is $4,000.

DR. PAYNE TALKS INTERESTINGLY ON GRAVELS IN SIBERIA

Thermodynamics as applied to gravels to be worked hydraulically or by dredging were discussed interestingly by Dr. Henry Mace Payne, of New York, at the Monday night session of the Mining Congress Convention. With the aid of the steroptican, Dr. Payne was able to point out with great clearness the application of his theories on gravel deposist in Siberia. Dr. Payne is on a lecture tour which will include a number of the important mining schools.

OUTLOOK FOR CHEAPER COAL IS NOT PROMISING

"Anyone who is at all cognizant of the trend in price of labor and material can see little hope of relief in lower costs for these items. Furthermore, observation of the advances made in mining methods in the last decade or two affords slight warrant for belief in any charge of wasteful operation. As consumers of coal we would do well to imitate the economy now enforced by the producers in their engineering practice." (Extract from the address of Geo. Otis Smith at the Mining Congress Convention.)

OPERATORS SLOW TO FOLLOW THEORY OF OIL OCCURRENCE

"It is now over thirty years since Dr. I. C. White first advocated his anticlinal theory of the deposition of oil and gas. Practical operators have been very slow to take full advantage of this important theory. No doubt their reluctance or failure to adopt it in guiding them in the search for new pools, and in developing known deposits, was due to a lack of full understanding of the application of the theory. The most common belief seemed to be, that to be correct, the theory should prove universally successful in its application. It is a common trait to expect too much of any new theory stepping out in advance and upsetting the equanimity of established practice, especially among men who have gained their knowledge by the sweat of their brow and long years of hard, practical operation." (Extract from address of J. C. McDowell at the Mining Congress Convention.)

COOPERATION MEANS HIGHEST POSSIBLE RECOVERY OF COAL

"Much of our very best bituminous and semi-bituminous coals, as well as anthracite, have been lost through methods that must be deemed wasteful in the light of present knowledge, but which under the circumstances could not be avoided. It is not through reckless competition, but through properly regulated cooperation that the highest possible recovery may be obtained, waste in mining, preparation, distribution, and utilization, reduced to a minimum, the public adequately served and protected, labor receive its just reward and capital a fair return." (Extract from address of E. W. Parker at the Mining Congress Convention.)

LAW SHOULD STIMULATE PROSPECTING, VAN WAGENAN HOLDS

"A mining law has for its purpose the attainment of two ends, namely, to secure the discovery of mineral deposits, and to encourage their development. The first has to do with the occupation of prospecting, while the latter is a matter of mining engineering. As mines cannot be developed until they are discovered, it seems clear that the paramount purpose of such law must be to stimulate the activity of the prospector." (Extract from address of F. W. Van Wagenan, at the Mining Congress Convention.)

Effect of Idle Mines

"Even with the average low resource cost of bituminous coal, the state of competition that is tied up with idle and half-worked mines results in an average total cost that is little below the average selling price." (Extract from the address of Geo. Otis Smith at the Mining Congress Convention.)

DANGEROUS PRACTICES SHOWN IN PHOTOGRAPHS

The exhibit made by the Bureau of Mines at the Mining Congress Convention was precise as well as practical. The feature of the exhibition particularly worthy of mention was a set of 200 underground photographs illustrating dangerous practice, with its results, and proper practices in bituminous coal mining. Fifty of the most common accidents were pictured in a series of from two to five photographs each. The set of pictures was made by the Bureau in cooperation with the Ellsworth Colleries Co.

A set of photographs and diagrams illustrated "rock dusting" in bituminous coal mines and the applicaton of rock dust barriers. A set of metal and coal mine accident statistical charts and charts showing the growth of the rise of permissible explosion and of electric mine lamps was exhibited. The following is a list of the apparatus displayed:

Fleuss Prato oxygen miners' rescue apparatus.

Draeger (by-pass) oxygen miners' rescue apparatus.

Fleuss one-half hour breathing apparatus.

Bureau of Mines oxygen resuscitator.

Surgeon's emergency chest.

Bureau of Mines first-aid cabinet for miners.

Mine air sampling outfit.

Coal sampling outfit.

Burrell gas detector.

Approved safety lamp.

Set of approved electric mine lamps.

Canary bird—carbon monoxide detector.

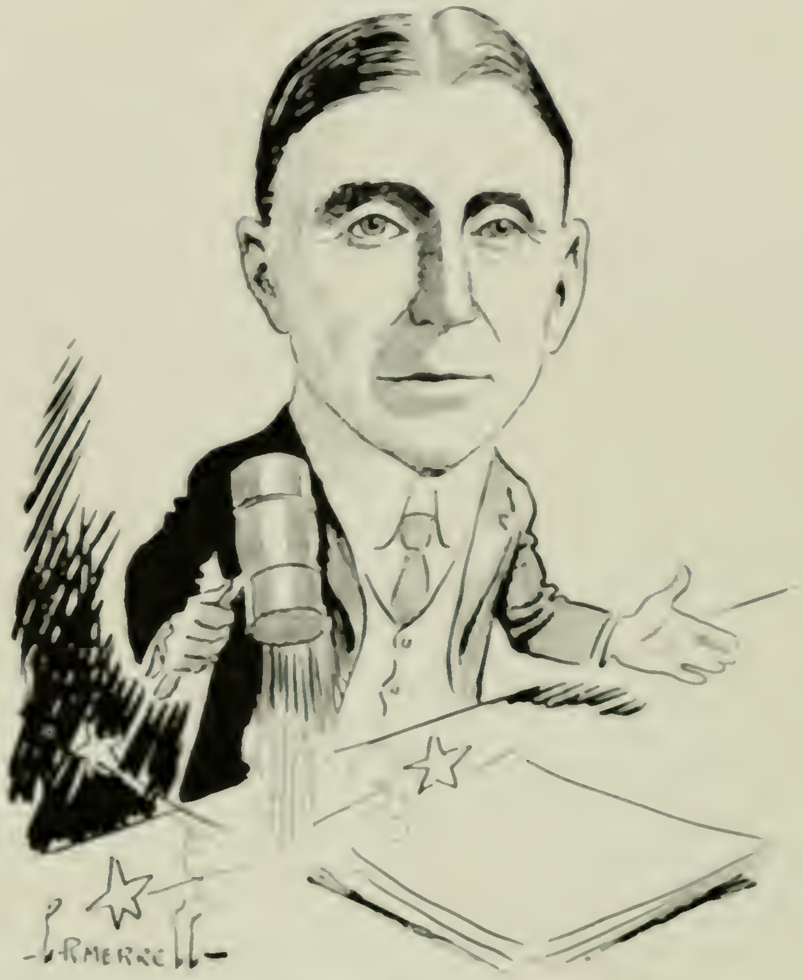
Map of United States showing field activities of the Bureau.

Floor plan and elevation of new all-steel mine rescue cars under construction.

Set of the Bureau's publications.

GAS TIGHT ROOFS URGED TO LESSEN FIRE HAZARD

"The most effective means known of reducing the fire hazard of oil in steel storage would be the equipment of all steel tanks with gas-tight steel roofs, properly vented, so as to eliminate any possibility of back-firing. All steel tanks and pipe lines connected to them should be thoroughly grounded electrically. The wooden roofs at present in use on steel tanks may be greatly improved by the addition of a substantial metallic sheathing, making good gas-tight electrical connection with the shell of the tank, thoroughly grounding the tank electrically, and making the roof gas-tight. The electrical connection between the metallic covering, over the wood, and the shell of the tank, may be made by bringing the sheathing over and under the angle iron at the top of the shell. This joint should be made gas-tight by means of caulking or a suitable material used as a gasket. The top angle should be tightly caulked to the shell, using additional rivets where necessary." (Extract from address by Garrett B. James at the Mining Congress Convention.)



A CARTOONIST'S CONCEPTION OF
WALTER DOUGLAS
The Mining Congress's New President

"OPPORTUNITY" AND "RESPONSIBILITY" MUST GO HAND-IN-HAND

"In this present moment the two words that seem to have made the deepest impress upon our minds are 'Opportunity' and 'Responsibility.' And let us not forget for a single moment that we cannot own the one and disown the other.

"Usually, in the affairs of nations, as of individuals, opportunity knocks but timidly. But with us the knock of opportunity is so imperious that it fairly batters down the door." (Extract from address of C. L. Dering at the Mining Congress Convention.)

LABOR TROUBLES STOP MINES IN SOUTHWEST

An official report to the Federal Reserve Board from the Dallas bank says:

"The copper industry continues active and the mines of west Texas and Arizona are running on full time. The coal mines of Oklahoma and west Texas, however, have suspended operations temporarily on account of labor disturbances. Reports from the New Mexico coal mines indicate that scarcity of labor is causing difficulty in filling orders. Demands are extraordinarily heavy."

LIGNITE GOOD GAS PRODUCER BUT HAS SOME DRAWBACKS

There are two extensive lignite fields in the United States. One occupies the western half of North Dakota, the northwestern corner of South Dakota, and the extreme eastern part of Montana; and the other occupies a wide belt across Texas and the other Gulf States.

The lignite beds of North Dakota and Montana are very extensive, both as regard thickness and geologic distribution. The exact number of beds has never been determined, but it seems probable that over most of the field in that region there may be from six to twelve, ranging in thickness from 4 to 35 feet. In the Texas field the beds are not known to be quite so thick, nor to underlie quite so large an area. Many of those that are worked range from 4 to 10 feet in thickness, and there is every reason to believe that the beds are much more extensive than present development indicates. It has been estimated that in the States of Oklahoma, Texas, North Dakota, South Dakota, and Montana there are at least 1,000,000,000,000 tons of lignite in beds over 3 feet in thickness.

There is considerable difference in the quality of the lignite of the two regions above mentioned. That of the northern region is largely composed of logs of wood, which still retain their shape, though reduced to the condition of true lignite. It contains when mined about 40 per cent of moisture, which, of course, soon evaporates in a dry climate; and the lignite on shrinking cracks badly, soon falling to pieces. The Texas lignite is not nearly so woody in its composition, apparently being composed mainly of small fragments of plants such as seeds and spore-cases. Much of it shows no trace of woody structure, and resembles ordinary brown clay. The Texas lignite is a somewhat better fuel than that from the northern region, being a little more like cannel coal, that is richer in bituminous matter. It, however, contains a heavy percentage of moisture, usually about 35 per cent when mined, and slacks in much the same way as the lignite from the northern fields.

On account of the heavy percentage of moisture and the slacking when this moisture is evaporated, it will not pay to ship this lignite to any great distance; and when it is shipped it must be protected from the weather by shipping in box cars. It also is of lower fuel value than ordinary coal and hence requires a larger grate surface to give the same amount of efficiency. With specially constructed furnaces, it makes a fairly good steaming fuel, and answers very well for domestic purposes. It has been used as a fuel for the manufacture of producer gas, and in tests carried on by the Geological Survey at the St. Louis Exposition in 1914 it was found that, by the aid of a producer and a gas engine, greater efficiency could be obtained from North Dakota lignite than from the very best steaming coal of West Virginia, used under an ordinary boiler and steam engine. Lignite has also been used for the manufacture of briquets. It is possible to make briquets of this material even without a binder, but so far as experiments have gone, the cost of manufacture is greater than the value of the briquet after it is manufactured. Lignite also has another feature which detracts greatly from its value as a fuel, that is its liability to spontaneous combustion, especially after it has slacked down or when it has been crushed to small fragments. In this condition it will take fire very readily, especially after a rain.

EVERY EFFORT MADE TO ELIMINATE REFUSE FROM COAL

Coal is washed to reduce impurities, ash and sulphur, and thus to improve the quality of the product either for the market or for making coke.

From the time the coal is broken down in the mine, every effort is made to eliminate the refuse. Miners are penalized for loading out dirt with the coal; bone and slate are removed on the picking tables in the tipples; and those alive to the best interests of the property never miss an opportunity to reject refuse found in mine or railroad cars. The motto of the progressive companies is "a clean product."

BAD TIME TO FOLD HANDS, DECLARES DR. W. R. WHITNEY

There was never a time when we Americans could so illy afford to fold our hands as at the present.

"May it not be that we are in a state of coma, induced by superficial prosperity and prolonged by the relatively scattered and disorganized conditions of our more recent past? For apparently good resaons, we have of late years entered upon a policy of discouraging the growth of corporations, of stranding the railroads, and of forcibly stopping large water power developments, and now we learn from the press that Germany and England are busy bringing about the union of competing manufacturing companies in order to strengthen home industry. England is planning a system of general industrial research to generally assist her manufacturers after the war. The scientific and engineering societies of Germany are banding together under a single president so as to render their cooperation more effective. These peoples are becoming aware of their power when acting collectively and of their dependence upon and interest in national undertakings to an extent unthought of a few years ago.

"Can we not in some way, without the pressure of war or the force of immediate necessity, determine by fair means and by enlightened public opinion the best policies to pursue in our many debated difficulties?" (Extract from the Mining Congress Convention paper of Dr. Willis R. Whitney.)

SEATTLE CHOSEN AS SITE FOR MINING EXPERIMENT STATION IN NORTHWEST

In Addition Bureau of Mines is to Undertake Cooperative Work with University of Idaho at Moscow and with the Oregon Bureau of Mines at Corvalles—Seattle Station to Serve Southern Portion of Alaska

Seattle has been selected by the Secretary of the Interior as the site of the mining experiment station for the Northwest. This decision was made on the recommendation of Van H. Manning, director of the Bureau of Mines. Mr. Manning, in company with F. G. Cottrell, chief metallurgist of the Bureau and Dorsey A. Lyon, who is to be in charge of the station, visited all the cities applying for this station and collected a large amount of data which was presented in support of the claims of the individual cities. After close consideration had been given to all facts presented, Mr. Manning, Mr. Cottrell and Mr. Lyon all decided in favor of Seattle. Secretary Lane concurred with this view.

In discussing the selection of the site for the station, Mr. Manning said:

"All of the data collected upon the trip was carefully weighed and the respective claims presented by the different localities were considered. The various needs of the whole region under consideration, especially in regard to interrelationship of its various parts, were modified and broadened by this careful study of the representations made by those best acquainted with the industry in each center.

"It has not been an easy matter to make a final decision on the location of the station, and even now the final decision is to a large extent based upon assumption as to the future policy with regard to the location of other stations, and the extension of a less formal cooperation to other existing institutions in the general region under consideration.

"As the result of careful consideration of the data collected regarding the problems to be undertaken and the facilities for cooperation offered in each case, I felt impelled to recommend that the station be established at Seattle, Wash., in cooperation with the University of Washington and that in connection with the work of this station, cooperation also be carried on with the University of Idaho at Moscow and with the State Bureau of Mines at Corvalles.

"The station at Seattle will be able to handle all the problems not otherwise provided for at the other stations by cooperative work, and also will take care of the problems which are met with along the southwestern and southeastern coasts of Alaska. By locating the station at Seattle, it will be possible to lay special emphasis upon electrometallurgical work, which is a matter of great importance, not only to the northwestern part of the United States, but to all the Alaskan coast as well.

"The establishment of these metallurgical experiment stations constitutes one of the most constructive steps that has been taken by Congress in the upbuilding of our mineral industry.

"It is a most deserved recognition of an industry which now has a yearly output of probably two and one-half billion dollars and which is next to agriculture in its importance to the welfare of the country. The experiment stations come to the West at a time when they are peculiarly needed. The great impetus which has been given the industry through the European war and the coincident development of the so-called oil flotation process in the utilization of the lower grade ores have emphasized the necessity for such research aid as only the Federal Government can give. With the development of metallurgical processes, many of which are now under way, I expect in the near future to see a much greater industry, enjoying greater prosperity and employing more men, with the utilization of the low-grade mineral deposits to their highest extent. Already there are signs that this is coming. Old mines are being reclaimed, abandoned dumps, which contained supposedly worthless material, are being worked over, and many prospects that heretofore were not considered workable are being turned into substantial mines."

At the Chicago convention of the American Mining Congress, Sidney Norman read this message to the Congress from the Northwest Miners' Association:

"Knowing the great part played by the American Mining Congress in the successful fight for recognition of the mining industry by establishment of the Bureau of Mines, your delegates call attention to the adverse criticism aroused in the Northwest by some unfortunate circumstances concerning location of the Northwest Mine Station. We believe that this is a subject that might properly be discussed at length, in order that conclusions may be drawn that would tend to remove prevalent friction and thus restore the high opinion formed of the Bureau under the ideals that have governed its conduct in the past.

"Spokane does not appear here as a contender for that honor. It does, however, ask the aid of this convention in furthering any legitimate plan that will insure location of that site at some point in close touch with the great Coeur d'Alene and other districts in northern Idaho, western Montana and eastern Washington. The isolation of the station at a point far removed from these districts would defeat the very object it is intended to attain and would at the sane time destroy the growing value and influence of the Bureau."

BITUMINOUS TRADE BETTER THAN IT HAS BEEN SINCE 1903

Discussing the situation in the Cleveland district the manager of the Federal Reserve bank reports to the board here as follows:

"So far as price and demand are concerned the bituminous coal trade is in better condition than it has been since the anthracite strike in 1903. The companies, however, are hampered in making deliveries owing to scarcity of railroad equipment, both cars and motive power, as well as inability to obtain sufficient labor. There is a tremendous shortage of coal in the Northwest. Prices at the mine have been from $2.15 to $3.50 per ton, and show the excitement which prevails in the market. It is reported that some industrial concerns have been forced to use their storage coal which is carried from year to year for emergencies. Furnace coke demand is in excess of the supply. Crude oil and gas operators are more active even than early in the spring when oil reached $2.60 a barrel."

FAY'S STATISTICAL WORK IS COMPLIMENTED HIGHLY

An unusual tribute has been paid to A. H. Fay, statistician of the Bureau of Mines, by Frederick L. Hoffman, statistician of the Prudential Life Insurance Company. Mr. Hoffman is regarded as a pioneer in the collection of accident statistics. Referring to Mr. Fay, Mr. Hoffman said:

"I would like to express my very high regard for the work that Mr. Fay has done. Mr. Moore has properly said that getting out statistics and doing the right kind of statistical work was just as important information as digging in the ditches and getting out the coal. Mr. Fay is the first man in this country to make order out of chaos. Until the Bureau of Mines took up this work the so-called statistics of the mining industry were always a delusion and a snare. Today our mining accident statistics are not only the equal of any foreign statistics, but they are very much better. They give us much more detailed information in a thoroughly digested form. With indefatigable industry he has dug out all the reports for forty-four years, and he has brought them all together in a manner that those of us who have tried for years and years to do, but have absolutely failed to accomplish. It is true he has had the cooperation of everyone, but he could not have had that cooperation if he had not been self-sacrificing and as efficient as he has been, and yet that man today has not even a real title to the position nor the proper status that his work entitles him to. The United States Labor Commissioner, in his field, has not been anywhere nearly as successful in bringing about the cooperation in labor statistics as Mr. Fay has brought about in mining statistics. All over the country every mine inspector cooperates with him, giving greater efficiency to the Bureau of Mines. In season and out of season he is working to bring about cooperation between the Federal Bureau and the State Bureaus. That must be brought about. We must have better cooperation.

"Absolute accuracy is not necessary. It is not even desirable, because the cost of absolute accuracy exceeds value. If you are going to put too heavy a strain on the mining companies for statistics, they will not do the work for you; they cannot do it. They must be taught the limitation of statistics, that you cannot prove all things that you would like to prove by means of these statistics.

"Now, take the question of shaft accidents. You can sub-classify shaft accidents to the extent of several pages, comprising all the things that might happen. I, at one time, tried to make up some statistics of men killed in mines. You would never have thought of it, but every year we killed a dozen men by icicles dropping down the shaft. That is a very important matter. I do not know in the matter of shaft accidents that there is a more important duty than for the man on the cage to see to it that no ice forms in the shaft. There is always water running down, and in the winter time it is freezing, and these heavy icycles used to fall down the mine and kill a man every once in a while. That is just a minor matter, apparently. You can bring that all out if you follow up the work that Mr. Fay is doing, by classifying each accident in detail. I would like to emphasize the work that Mr. Fay is doing in the Bureau of Mines, which I think is entitled to the highest appreciation."

GOVERNMENT SERVICE NEEDS POLICY AS TO PATENTS

"A foremost need at present would seem to be the definite location of responsibility for the study and gradual development of a comprehensive and consistent system of administration of the whole subject of patents within the government's own service.

This guiding and unifying element between the different departments should be permanent in its character and organization, as the work must constantly develop and maintain a thoroughly up-to-date and helpful relation to the industries. The fundamental aim of government patents need be in no sense that of destructive competition with private enterprise, but on the contrary, should be to aid, encourage and stabilize the latter by supplying some of the connecting links for whose early development it might be particularly hard to secure private backing, even though the final result was of recognized public benefit." (Extract from F. G. Cottrell's address at the Mining Congress Convention.)

WITHDRAWALS AND RESTORATIONS

A summary of the principal withdrawals and restorations during the period, March 4, 1913, to October 31, 1916, in acres is as follows:

	Outstanding withdrawn March 4, 1913	*Withdrawn during period*	*Restored during period*	*Outstanding withdrawn October 31, 1916*
Coal	65,410,464	668,664	20,645,002	45,434,126
Oil and gas	4,817,706	1,656,064	692,397	5,781,373
Phosphate	3,367,378	489,601	1,350,581	2,506,398
Potash	133,829	211,384	214,584	130,629
Power site	1,857,258	744,926	194,220	2,407,964
Public water	86,216	112,594	2,702	196,108
Total	75,672,851	3,883,233	23,099,486	56,456,598

FIRST-AID TRAINING HAS USES OUTSIDE OF MINES

An engineer of the Bureau of Mines reports that his training in first aid possibly saved the life of his three-year-old son. The boy attempted to crawl downstairs while ill, and fell. His father reached him about 10 or 15 seconds after he fell and he was not breathing. He shook the boy and slapped him on the back to start his breathing, but this treatment did not succeed. He then placed the boy on his stomach on the floor in the position recommended for the Schaefer treatment for artificial respiration, The boy's jaws were forced open with difficulty, when his tongue fell forward and almost immediately his throat seemingly cleared, and he soon took a deep whistling breath. After a few seconds he took another breath and became conscious.

It is probable that when he fell he struck the back of his head, which caused his tongue to fall back into his throat and prevented his breathing. The time that elapsed after he fell until he took his first breath was estimated to be 1½ to 2 minutes. His lips had become quite blue and his body, with the exception of his jaws, quite limp, therefore his recovery was probably due to the prompt treatment. He was placed under the care of a doctor for a day or two and regained health rapidly.

WAGES REPRESENT HALF OF THE COST OF COAL

"Should you be interested in summing up the various costs and striking a balance between labor's share and capital's return, you would find that the mine worker, the trainman, and the wagon driver together receive fully half of the price of the anthracite delivered at your house, and the same three classes of labor receive not less than half the price paid by the average consumer for the cheaper soft coal." (Extract from the address of Geo. Otis Smith at the Mining Congress Convention.)

WASTE HAS INCREASED AS PRODUCTION ADVANCED

"Increase in production has been accompanied by unparalleled waste, in both the production and utilization of our mineral wealth, and altogether too little regard for the health and safety of the men whose labor converted the natural resources into the commercial products. A people of restless energy, individualistic, eager for immediate success, and having little regard for the lessons of the past, we have indulged in an orgy of hasty exploitation, with the result that already we are nearing the limit of maximum production of some minerals." (Extract from address of Van H. Manning at the Mining Congress Convention.)

DISAGREE AS TO INFLUENCE OF MINE WORKERS UNION

E. H. Weitzel, of the Colorado Fuel & Iron Company, made the point in the Uniform Mine Legislation section that it was difficult to enforce discipline among members of the United Mine Workers. Seemingly, he said, the members of this order feel that the authority of the company is not final, which in many cases results in a serious interference with efficiency.

This statement was challenged by Mr. Harlin, of the United Mine Workers, who said: "If Mr. Weitzel's company had displayed the right kind of spirit in getting acquainted with the position of the United Mine Workers in this matter, he would be more competent to express an opinion. The United Mine Workers are ready to aid in every possible way the rigid enforcement of safety laws. Even a superficial knowledge of the record of our organization is sufficient to show that we have gone more than half way at all times in the matter of cooperation.

J. Dalrymple, chief mining inspector of Colorado, advocated that mine foremen be held responsible for the setting of timbers in mines. He urged that the mine foreman have authority to remove from the mine any employe disregarding safety practices.

Smoker
Nineteenth
Annual Session
of the
American Mining Congress
Hotel La Salle Nov. 14, 1916
Chicago
Kaufmann & Fabry Co
Chicago
16 3242

MINING CONGRESS SMOKER, NOVEMBER 14

PRESENTATION OF WATCH TO CARL SCHOLZ FEATURE OF CHICAGO BANQUET

Social Portion of Mining Congress Convention Program Was Highly Successful—Six Hundred Guests Join in Singing Old Time Songs at Smoker—Judge Short and Col. Pope Speak at Banquet

Coupled with the important business transacted at the Chicago Convention of the American Mining Congress were several pleasant social features. The more important of these was the banquet held in the ball room of the LaSalle Hotel on the night of November 16. It was on this occasion that the members of the Mining Congress presented Carl Scholz, the retiring president, with as fine a product of the watch makers' art as money could buy. Mr. Scholz has served three terms as president of the American Mining Congress and during that time has been an indefatigable worker in its interest. He has done much to increase the usefulness of this organization which is now exerting a national influence recognized by all who mine, as was testified to by so many of those who attended the convention at Chicago.

The presentation of the watch to Mr. Scholz impressed all those who saw it. Mr. Scholz had started to deliver his farewell address. Before he had proceeded far he was interrupted by E. W. Parker, of the Anthracite Bureau of Information, who quite to Mr. Scholz' surprise began a rambling talk, the theme of which was "time." Mr. Scholz had no idea that a gift was forthcoming and his perturbation was the source of considerable amusement as Mr. Parker rambled on in his talk about "time." He even recited poetry with a bearing on time. Finally Mr. Scholz turned to the toastmaster and whispered if by any chance Mr. Parker had departed from his policy of total abstinence. As nearly every one present, judging from Mr. Scholz' expression and possibly by reading his lips, could divine the nature of the question it was with greatest difficulty that those at the banquet tables suppressed the desire to burst into laughter. Finally Mr. Parker drew to a close his dissertation on "time" and presented the watch. The utter surprise of Mr. Scholz brought forth a great demonstration from those assembled. The applause continued for several moments. Mr. Scholz attempted to thank the members of the Congress for their gift but words failed him.

In response to toasts Col. George Pope, of the National Manufacturers' Association, and Judge Frank H. Short, of Fresno, Cal., spoke interestingly. Col. Pope pointed out the intimacy of the relationship which exists berween the miners and manufacturers. Judge Short built his discourse on the following parable:

"Uncle Sam being the father of four sons and so that we would have our history and our geography straight, we will call them East and North and South and West, and Uncle Sam being a good father, generous, perhaps, to a fault, proceeded to distribute to his three elder sons, East and North and South, all of that portion of the estate that went to them and their children. Whether he did it wisely or unwisely we don't know, but that he did it we cannot deny. And that portion of the estate that fell to the younger brother, West, was not supposed to be worth a very great deal, being mostly deserts and mountains and wilderness and all that sort of thing. But West was quite an industrious fellow, inclined to exploration and all that sort of thing, and he began to demonstrate that by taking those wonderful rivers that head in those real mountains and traverse real valleys into the world's most majestic sea, by the development of the power and the distribution of water it began to look that the inheritance of the younger brother, West, was really pretty near one-quarter of the estate, and it was about that time that a great idea of regeneration and moral uplift seized the minds of East and North and South. And the more they thought about it the worse they felt about it, and finally they went to Uncle Sam and said, 'Father, in the distribution of that portion of your estate which you have distributed to us and to our children you have sinned against heaven and in the sight of all men and have greatly impaired the family estate. The only recompense that we can suggest and the only atonement is that you take, seize and hold that portion that was supposed to belong to the younger brother for the benefit of the whole Sam family.'"

Much of the success of the banquet was due to George T. Buckingham, the toastmaster. Mr. Buckingham with his eloquence and wit added materially to the enjoyment of the evening.

Much credit is due the management of Hotel LaSalle for the success of the banquet, the smoker and the arrangements for the convention in general. The facilities of the hotel were generously placed at the disposal of the Mining Congress.

The menu served at the banquet follows:

TOMATO FARCIS, VANDERBILT

CLEAR GREEN TURTLE, EN TASSE
CELERY SALTED ALMONDS OLIVES

BROOK TROUT, AU BLEU
POTATO PERSILLADE CUCUMBERS

BROILED SWEETBREADS ON TOAST
GREEN PEAS, BONNE-FEMME

ROAST JUMBO SQUAB, AU CRESSON

SALAD—LA SALLE
CHATELAIN DRESSING

FRESH STRAWBERRY SOUFFLE ALASKA
ASSORTED CAKES

DEMI-TASSE

"Fair and Warmer" Cocktail
Imported Cigars
Cigarettes

More than 600 men occupied places at the tables which filled the great ball room of the Hotel LaSalle on the night of November 14 when the members of the Mining Congress and their guests met at a smoker. While the refreshments were being served a very capable troupe of entertainers added materially to the success of the convention. One of the features of the smoker was the singing of old-time songs by all present. Aided by the musical director and orchestra those present made the place ring with such songs as: "Hail! Hail! The Gang's all Here"; "Don't Bite the Hand That's Feeding You"; "Rings on My Fingers"; "Oh, You Beautiful Doll"; "Dixie"; "The Star Spangled Banner, and "Hello, Hawaii, How Are You."

While the members of the Congress were enjoying the smoker their wives were entertained at a theater party.

USE OF PERMISSIBLE EXPLOSIVES INCREASES RAPIDLY

"The Bureau of Mines has been responsible for a revolutionary change in the use of explosives in coal mines. It pointed out the dangers attending the use of black powder in mines that were gaseous or filled with coal dust, and urged the substitution of what it termed 'permissible explosives,' those that had successfully passed severe tests. In the year 1906 only 2,000,000 pounds of these permissible explosives were used in the coal mines of the United States. In 1915 the amount of permissible explosives sold was 27,500,000 pounds, or nearly fourteen times as much as in 1906." (Extract from address of Van H. Manning at the Mining Congress Convention.)

GOVERNMENT REGULATION OF COAL PRICES MAY COME

"Study of present conditions in the coal mining districts fails to encourage the idea of governmental operation of the 7,000 coal mines in this country. More in line with the trend of public sentiment in the last decade, however, is governmental control in the interest of the consumer by regulation of prices, and to judge from the facts of experience in the regulation of transportation of other public utilities, the public coal commissions will be given sufficient discretionary powers to safeguard the interests of producer and consumer alike, and even mandatory requirements, either legislative or executive, will be subject to judicial review." (Extract from the address of Geo. Otis Smith at the Mining Congress Convention.)

MEMBERS OF MINING CONGRESS PRAISE SCHOLZ AND CALLBREATH

Tribute was paid by members of the Mining Congress to the retiring president, Mr. Scholz, and to the secretary, James F. Callbreath, at a members' meeting held during the Mining Congress Convention. The fact that as busy a man as Mr. Scholz would take a portion of his time toward forwarding cooperation among those connected with the mining industry was the theme of those who commended him.

The large amount of work which has been done by the Mining Congress with a very small amount of money is one of the accomplishments of Mr. Callbreath's work, which was complimented.

The establishment of a Bureau of Mining Economics, modeled after the Bureau of Railway Economics in Washington, met with favor at the members' meeting.

THINKS THE COAL INDUSTRY WELL MAY BLAME ITSELF

"The Coal Industry of this country does not occupy that position which it should in the Industrial World. And there is no one to blame, except those who are engaged in that industry, and it remains for the operators and miners through their own efforts to make out of the industry that which they are entitled to." (Extract from address of Thomas M. Gann, at the Mining Congress Convention.)

NO REWARDS OFFERED FOR DISCOVERY OF MINERALS

No reward has ever been offered by the United States Government for the discovery of a tin, nickel or any other metallic deposit. Numerous inquiries are reaching Washington with regard to such a reward. It is thought probable that publication has been made of some fanciful tale of a bonus being offered for the discovery of these metals.

COKING OF ALL COAL WILL MEAN A CLEANER NATION

The close relation between coal, shale, peat, oil and gas, was brought out with singular clearness by Dr. W. F. Rittman in an address before the oil section, at the Mining Congress Convention. He showed how benzine toluene, etc., are the bases for the manufacture of practically all dyes and explosives. While coal as such does not contain benzine and toluene, these materials are formed in the distillation process, and can be made from any one of the other materials. An all-coal source for artificial gas must be found, Dr. Rittman declared. He believes it is well within the range of possibility to enrich the gas from the by-product oven.

Dr. Rittman predicted the general use of smokeless fuel within the comparative near future. While all the volatile matter will not be removed in the partial coking of this fuel, it will be reduced to 6 or 10 per cent. He believes means will be found for the coking of any kind of coal, which he said will mean a cleaner nation.

"The total amount of money appropriated by the Federal Government in behalf of agriculture for the present fiscal year is $35,553,852.

"The total amount of money appropriated by the Federal Government for this year for mining is $2,333,075. This includes the total appropriations of the Bureau of Mines and the United States Geological Survey.

"The per captia contribution of the people for the betterment of agriculture is 34 4-5 cents.

"The per capita contribution of the people for the betterment of mining is 2 3-10 cents.

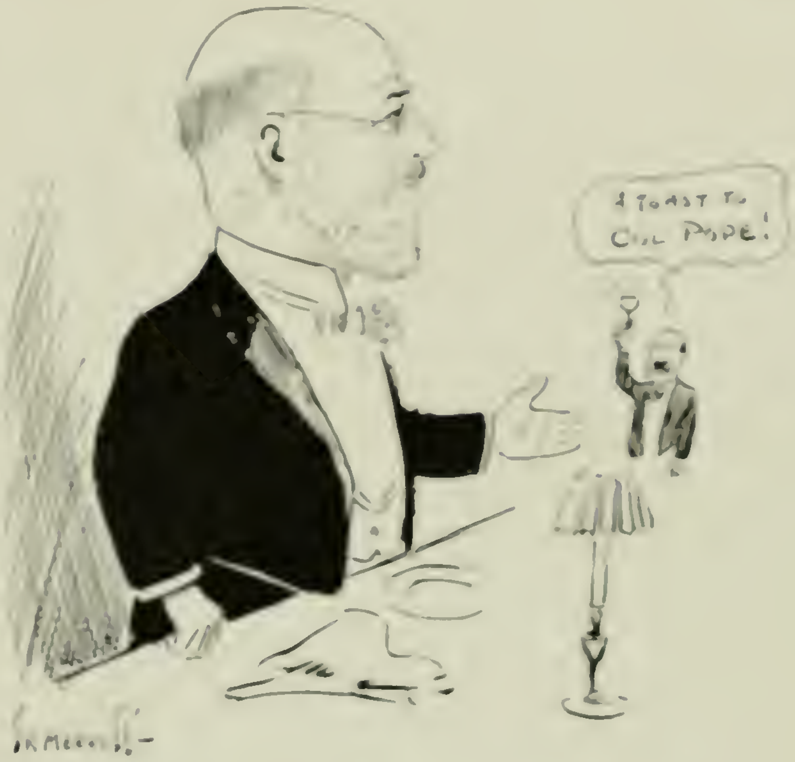
"The gross value of all agricultural products in the year 1915, as estimated by the Department of Agriculture, is $10,501,636,000.

"The gross value of all raw mineral products for the year 1916, as estimated by the United States Geological Survey, is $2,373,000,000.

"The per capita production of agriculture is $102.94.

The per capita production of mining is $23.26.

"While the value of the agricultural production of the country is less than five times that of the mineral production, the mineral production, the per capita appropriation for agricultural investigations is fifteen times the per capita appropriation for mineral investigation." (Extract from the Mining Congress Convention Address of Van H. Manning.)


A TOAST TO COL POPE!

A CARTOONIST'S CONCEPTION OF
COL. GEO. POPE
at the Mining Congress Convention

MINING NOT SO WELL ORGANIZED AS AGRICULTURE

"Mining is becoming better organized, and a number of organizations, notably the American Mining Congress, are now working in its behalf, but we have much farther to go to reach the stage of organization attained by agriculture." (Extract from address of Van H. Manning at the Mining Congress Convention.)

ADEQUATE ACREAGE NECESSARY TO CONSERVATION OF OIL

"If you would prevent waste of oil and natural gas, if you would do away with careless drilling methods, excessive production charges and storage losses, if you would insure the production of the maximum amount of oil at the minimum cost, if you would help to maintain a reasonable price for petroleum and its products in the years to come; then do your part in creating a public sentiment in favor of adequate acreage. If you take one step toward imbedding the acreage idea in the popular mind, or incorporating it into State legislation, or embodying it in oilfield practice, you will have assisted in conserving the oil and gas deposits of the United States, and will have rendered a valuable public service." (Extract from address of Max W. Ball at the Mining Congress Convention.)

Only One Settlement Possible

"This oil question cannot be settled until it is right, and such a settlement cannot be made which does not protect the interests of those who entered upon the lands in good faith and developed the property by discovering oil" (Extract from address of Roy A. Bishop at the Mining Congress Convention.)

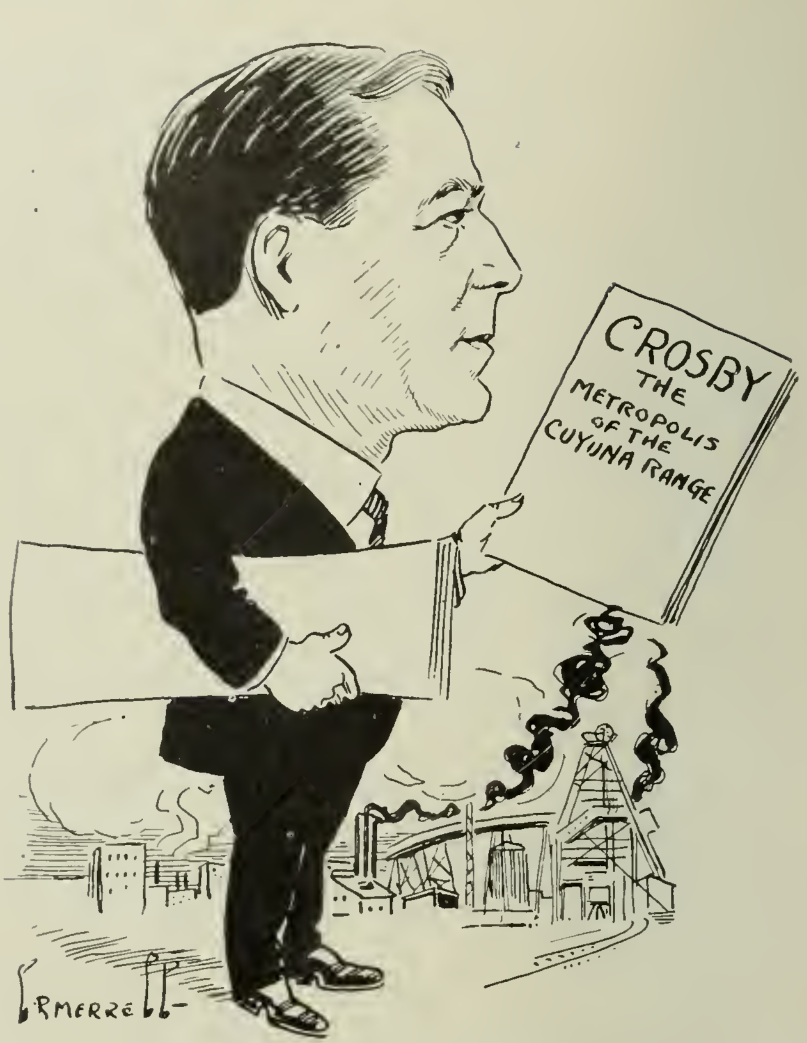
HOLD MEMBERSHIPS IN MANY SCIENTIFIC SOCIETIES

Members of the Bureau of Mines staff have membership in scientific societies as follows:

Alabama Safety Association; American Association for the Advancement of Science; American Chemical Society; American Electrochemical Society; American Institute of Electrical Engineers; American Institute of Metals; American Institute of Mining Engineers; American Iron and Steel Institute; American Mining Congress; American Physical Society; American Society of Civil Engineers; American Society of Mechanical Engineers; American Society of Social and Political Science; American Society for Testing Materials; American Waterworks Association; Botanical Society of America; British Institute of Metals; British Iron and Steel Institute; Canadian Mining Institute; Coal Mining Institute of America; Colorado Metal Miners Association; Colorado Scientific Society; Engineers Society of Northeastern Pennsylvania; Engineers Society of Washington; Engineers Society of Western Pennsylvania; Frieburg Geol. Geschellschaft; Geolcgical Society of America; Geological Society of Washington D. C.; Illinois Academy of Science; Illinois Mining Institute; Illinois Society of Engineers; Indiana Academy of Science; Institute of Mining and Metallurgy (London); Institute of Mining Engineers (Great Britian); International Congress of Applied Chemistry; International Engineering Congress; Kentucky Mining Institute; Lake Superior Mining Institute; Mine Inspectors Institute of America; Mining and Engineering Society of Alaska; Mining and Metallurgical Society of America; National Conservation Society; National Geographic Society; National Safety Council (includes N. M. S. A.); Natural Gas Association; Pittsburgh Smoke Abatement League; Rocky Mountain Coal Mining Institute; Society for the Promotion of Engineering Education; Society of Tennessee Mine Foremen; Southwestern Mine Safety Association; Washington Academy of Science; West Virginia Coal Mining Institute; Western Society of Engineers; Wyoming Society of Civil Engineers.

MUCH ENERGY WASTED IN RETAILING OF COAL

"It has been said that it costs more to deliver a quart of milk in the city of New York than it does to get it from the cow to the city. What can be more illustrative of useless expense than half a dozen or a dozen milk wagons from as many different establishments delivering milk to one city block? Delivery of coal is not exactly akin to delivery of milk, for one coal cart cannot deliver 50 to 100 tons of coal as a milk wagon delivers that many quarts of milk, but there is just the same more waste energy in the retailing of coal than in its mining, preparation, or transportation, or possibly all of them put together." (Extract from address of E. W. Parker at the Mining Congress Convention.)



A CARTOCNIST'S CONCEPTION OF
GEO. H. CROSBY
at the Mining Congress convention

RESPIRATION RESTORED BY UNIQUE METHOD

A surgeon in one of the Southern coal producing States, recently invented a new method of establishing respiration by reflex action. He had been using ordinary methods for several hours and was barely keeping the patent alive, although he had worked very hard. Happening to see a comb on a dresser, near the bed on which the patient lay, he took it and drew it smartly across the nose, the teeth of the comb coming into contact with the septum between the nostrils. The patient at once began to breathe and his respiration soon became normal. It was necessary to repeat the operation several times, but the patient finally recovered.

Only One Excuse

"The only reasonable excuse that the Navy can give for desiring to appropriate the land in the possession of the oil men is that the property has already been developed, and producing oil wells drilled at an expense of millions of dollars are upon the land ready for use." (Extract from the address of Roy A. Bishop at the Mining Congress Convention.)

Rises from 60 cents to $11.65

Tungsten (powder) sold as low as 60 cents a pound a few years ago. In 1915 ferro-tungsten reached $8.50 and in 1916, $9.75 for the contained tungsten. Powder was not greatly different but a little was sold as high as $11.65.

THE
MINING CONGRESS
JOURNAL

PUBLISHED EACH MONTH BY
THE AMERICAN MINING CONGRESS.
Munsey Building. Washington, D. C.

Subscription Rate, per year............. $2.00
Single Copies......................... .20

Entered as Second Class Matter January 30, 1915, at the Postoffice at Washington, D. C.

DECEMBER, 1916

FINISHED MATTE AT SUDBURY CONTAINS 55 PER CENT NICKEL

In a publication entitled "Some Notes on the Mines and Smelter of the Canadian Copper Company, Copper Cliff, Ont.," prepared for the Twelfth International Geological Congress, the following notes are given about the reduction of the nickel-bearing pyrrhotite of Sudbury, Ont.:

"To understand the smelting operations, it must be premised that copper and nickel matte smelting is entirely opposite in its principle to the blast furnace treatment of iron ores. In the iron furnaces, the operation is conducted in a reducing atmosphere, with the intention of reducing all the iron present to metallic form and preventing its passage into the slag. In copper and nickel smelting, on the other hand, the operation is conducted in a strongly oxidizing atmosphere, with the intention of driving as much as possible of the iron into the slag, and saving only the copper and nickel with sufficient sulphur to prevent their oxidation. Copper and nickel combine with sulphur in the blast furnace to form what is known as matte. This matte contains iron in amounts which vary inversely with the amount of oxidation attained on the roast yard and in the blast furnace. If the ore is roasted to 10 per cent suplhur, the furnace matte may contain 30 to 40 per cent copper nickel, and from 40 to 30 per cent of iron, while if the ore is roasted to about 14 per cent sulphur, the furnace matte may contain only 18 to 20 per cent copper nickel, with about 50 per cent iron. It is evident that if the ore is poorly roasted, the oxidation attained in the blast furnace must be relatively greater than is necessary with well roasted ore. This furnace oxidation is attained by the addition of quartz in the blast furnace. This quartz prevents the rapid smelting of the ore, and by holding it in the blast furnace, under the influence of a powerful blast of air, allows the oxidation of about 50 per cent of the sulphur and iron, contained in the roasted ore. The iron oxide formed on the roast yard and in the blast furnace, combines with the quartz to form a slag which contains about 55 per cent iron oxide, in the form of silicate of iron. This silicate of iron can often be found in crystalline form on the slag dump

Limestone is used as a flux only when the furnaces are in poor condition. The addition of a lime base to the slags lowers their melting point, and thus allows the cleaning of accretions from the sides of the blast furnace. In certain cases, when the ores are very rocky and particularly if much aluminium is present, the addition of a small amount of limestone to the charge is indicated.

. . . .

The melted products flow continuously from the furnace into an oval brick-lined settler. In this settler the matte separates from the slag, . . . The slag runs continuously from the settler into pots, which are taken to the dump. The matte is tapped from the bottom of the settler into pots and transferred to the converter building. This furnace matte contains about 6 per cent copper, 16 per cent nickel, 47 per cent iron and 27 per cent sulphur. It is treated in the converter department by blowing air through it to convert the iron into iron oxide, which iron oxide, as fast as formed, unites with quartz or mine rock, which is placed in the converters as a flux. The continuous blowing of air through the matte, and the continuous removal of the iron in the shape of converter slag, removes the iron from the matte and leaves a final product containing about 80 per cent copper nickel, with about 0.5 per cent iron and 19 per cent sulphur, which is known as Bessemer matte.

The converters are cylindrical iron vessels, 37 feet long by 10 feet diameter, lines with magnesia brick and capable of rotation on a horizontal axis. A slot shaped opening in the front of the converter allows the slag to be poured off as desired.

The finished matte, which contains 25 per cent copper, 55 per cent nickel, 0.5 per cent iron and 19 per cent sulphur, is cast into slabs, broken by hand, loaded into box cars and shipped to the refineries in Bayonne, N. J.

BRUTE FORCE AND HIGH SPEED ARE ADDED IN AMERICA

"I want to emphasize the necessity which confronts us of devoting greater attention to natural sciences and to the unearthing of those values of natural knowledge which nothing but mining in facts will provide. I want to see our country get out of the habit of too exclusively awaiting fundamental discoveries from abroad and merely developing them by the application of brute force and high speed." (Extract from the Mining Congress Convention paper of Dr. W. R. Whitney.)

Latest Mining Patents

Concentration of Ores. No. 1203375. This invention is by Fleury James Lyster, of Broken Hill, New South Wales, Australia, assignor by Mesne Assignments to Minerals Separation American Syndicate (1913) Ltd., of London, Eng.

This invention relates to improvements in the concentration of ores and is particularly applicable to the separation of mixed zinc and lead sulphide ores.

The object of this invention is to separate metalliferous portions of an ore such as the sulphide of lead (galena) from other portions of the ore, and more particularly to effect a differential or selective flotation in the treatment of mixed zinc and lead sulphide ores, to wit: The separation of lead and sulphide (galena) from zinc sulphide (blende), obtaining a product relatively rich in lead on the one hand, and a zinc product relatively low in lead on the other hand.

ROCK-DRILL

No. 1203284. This invention is by Daniel S. Waugh, of Denver, Colo., Assignor to the Denver Rock Drill Manufacturing Company of Denver, Colo., a Corporation of Delaware.

The invention relates more particularly to that type of rock drills in which the drill is advanced to its work by fluid pressure. In this type it is the usual practice to employ a feed cylinder and a feed piston operating therein. One of these is connected to the motor. For certain types of work it is desirable that the cylinder be connected to the motor and the piston has a rod or spur projecting from the rear end of the feed cylinder.

It is one of the objects of the present invention to employ the above described specific arrangement and to provide in connection therewith, conveniently accessible means for controlling both the supply of the motive fluid to the feeding means and the arm, and also to control the supply of the cleansing fluid.

BY-PRODUCTS FROM COAL

No. 1204647. This invention is by Harvey P. [illegible], of Detroit, Mich.

This invention has reference to a process of obtaining coke and by products from coal, and its object is to produce coke containing such a percentage of volatile matter as to provide a smokeless fuel burning freely with a long flame, and also to produce condensable by-products of superior quality and of increased quantity.

PROCESS OF EXTRACTING METALS

No. 1204843. This invention is by Sidney E. Bretherton and Frank L. Wilson, of Berkeley, Cal.

This invention relates to a process of extracting metals of commercial value from their ores.

The object of the invention is to provide a process for the extraction of certain metals such as zinc, cadmium, copper, nickel, cobalt and other commercially valuable metals from ores containing the same.

The invention possesses other advantageous features. Any suitable apparatus may be used for carrying out the process. The process is especially adapted for use in connection with zinc sulphide ores.

CHEMICAL CONCENTRATION

No. 1204932. This invention is by Charles S. Bradley, of New York, N. Y.

This invention relates to the concentration or recovery of ore values by wet chemical methods. The invention comprises an improved method of conducting the operations of chemical concentration, apart from the specific materials or chemical reactions employed. The invention further comprises a number of improved chemical treatments which are of especial importance in the concentration of ore values.

According to this invention the operations are conducted in such a manner that the necessity for chemical analysis is largely avoided and excesses of the reagents employed may be maintained without loss, whereby complete extraction is obtained and the operations proceed with a minimum of attention and the supply of acid radical and oxygen may be readily and positively adjusted. Where metals of variable valency are to be recovered the presence of high valency compounds is highly advantageous to the extraction as they aid in the dissolving of the values and tend toward complete extraction. On the other hand, the separation of the values from the solution and their ultimate recovery in highly concentrated form may be more economically effected from the low valency compounds as these are already partially reduced.

MINING MACHINE

No. 1205076. This invention is by Albert Ball, of Claremont N. H., Assignor by Mesne Assignments to Sullivan Machinery Company, of Boston, Mass., a Corporation of Massachusetts.

This invention relates to mining machines, being more particularly intended to provide improved means for feeding and guiding a mining machine while performing the cutting operation.

ORE ROASTING FURNACE

No. 1203613. This invention is by John Harris, of Sheffield, England.

This invention relates to rabbling appliances for mechanical ore roasting furnaces of the type in which the rabblearms project into the interior of a hollow shaft longitudinally divided into channels for the conveyance of the cooling fluid to the arms, its object being to provide improvements in the means for securing the arms to the shaft and in the arrangement of pipes for supplying cooling water to the arms by the employment of which, when the arms are water cooled, the shaft itself may be air cooled with or without a forced draft and any one arm may be more easily and quickly removed or replaced without disturbing any other parts, while the same fittings may be used to secure when desired an air cooled arm to the shaft.

LIQUID SEPARATION OF IRON ORES

No. 1203897. This invention is by Arthur J. Moxham, of Wilmington, Del.

The object of this invention is to concentrate iron ore and reduce the percentage of silicious material or gangue. It has been proposed to take ore containing in its natural state combined water, organic matter or any other reducing agent, and also containing a much higher percentage of silicious material than is advantageous for use in the blast furnace, and subject the same to ordinary calcination for the purpose of driving off the combined water or other matter capable of being driven off by heating. This increases the specific gravity of the oxide of iron while the specific gravity of the silicious material is not increased. Anything increasing the difference between the specific gravity of the constituents of the ore that it is desired to separate acts advantageously in the process of separation.

CONCENTRATOR

No. 1204333. This invention is by Lynn W. Barner, of Hetland, S. D.

This invention relates to improvements in concentrators for ore separators of the reciprocating type, and particularly to improvements in the construction of the separating elements proper whereby the precious metal is separated from the material by which it is carried.

The primary object of the invention is to provide a novel construction of concentrating or separating mechanism by means of which the material is carried through a long range of travel within a comparatively small working area and subjected throughout such course to separating actions by which maximum efficiency of operation is secured. A further object of the invention is to provide a construction of mechanical concentrator or separator which is economical in construction and operation.

Aviator Carries Ad. Contract

Advertising invaded the air when Victor Carlstrom, the aviator, at the end of his Chicago to New York flight in his big biplane delivered to the New York Times an advertising contract of 50,000 lines placed by the Mahin Advertising Company, of Chicago, for the B. F. Goodrich Company, of Akron, Ohio.

SALES OF ZINC ORE ARE RUNNING AHEAD OF 1915

An official report to the Federal Reserve Board from the Kansas City bank says:

"A report recently issued shows that the Joplin (Missouri-Kansas-Oklahoma) district produced 8 per cent of the total lead ore in the United States last year, the value thereof being in excess of two and one-half million dollars. The production for the first thirty-nine weeks of 1916 sold for more than the entire 1915 production. Zinc ore produced will also exceed that of 1915, the value of that sold the first forty-one weeks of 1916 exceeding the total sold last year.

"According to State estimates, Colorado's metal output for 1916 will be more than 25 per cent larger than last year, the greatest in the history of the State. New mines are still being located, old mines are being reopened, every miner in the State has work, and there is an unprecedented demand for labor at the mines.

"The complete success of the flotation process, referred to last month, is said to have been established at Goldfield, a number of deep shafts are in progress, and preparations are under way by the principal producing companies to increase their ore-handling facilities. An unusually rich body of ore has been encountered at Cripple Creek at a depth of more than 1,900 feet. It was formerly assumed that below 1,000 feet the district would be worthless in so far as the production of gold is concerned. Since the first of the year 350 new mining companies, the majority of which are liberally financed, have been incorporated to operate in this State.

"In the Mid-Continent oil field a further contraction is reported from the Cushing and Shamrock districts, the total production in the Mid-Continent field now being placed at approximately 340,000 barrels daily. The Cushing field, when at its height, alone produced almost this daily total. Lack of water for drilling has held back considerable work. Last month witnessed a decline in the number of completed wells and also in new work. October is expected to witness a gain in both completed wells and in new work, as the purchasing companies are taking all oil. Many wildcat tests are under way in Kansas and Wyoming. The development of Wyoming's oil resources is progressing rapidly."

TELLS FRIENDS NEVER TO MISS MINING CONVENTION

A very prominent mining man writes as follows concerning the two days he was able to attend the sessions of the Mining Congress Convention:

"I do not believe I ever spent two days so filled with interest or that were as instructive. I have told my friends since coming home that no one in the mining industry can afford to miss a Mining Congress Convention. I expect in the future to be a regular attendant."

LATE L. M. JONES WAS HONOR MAN IN CLASS AT COLUMBIA

L. M. Jones, the mining engineer of the Bureau of Mines, who was asphyxiated on October 20, 1916, while assisting in recovery work after an explosion at the mine of the Jamison Coal and Coke Co., at Barrackville, W. Va., was born at Cleveland, Ohio, on December 12, 1883.

On February 19, 1909, he entered the service of the Technologic Branch of the U. S. Geological Survey, taking up his residence at Pittsburgh, Pa. In 1910, when the work of the Technologic Branch was transferred to the Bureau of Mines, Mr. Jones entered the service of the Bureau and continued in the service up to the date of his death.

He was a graduate of the Columbia School of Mines and was one of the honor men of his class. His leadership of men, beginning thus early in life, characterized his last effort in a humane endeavor to save life. He was leading his men when he gave up his life.

Mr. Jones was a mining engineer of exceptional ability and had immediate charge of the experimental mine at Bruceton, Pa. In this capacity he developed many safeguards that are instrumental in saving life in the coal mines. It was at the experimental mine that the coal operators of the United States received their first real impressions of the destructiveness of an explosion of coal dust without the presence of gas and were given demonstrations as to the methods to be pursued in preventing such disasters. The fact that the death record among the miners during the last year was the lowest in the last sixteen years emphasizes the worth of Mr. Jones's efforts in behalf of the miners. Mr. Jones was an important factor in the development of more orderly and safer methods of rescue work. He died a martyr to the cause, as three other rescuers of the Bureau have died.

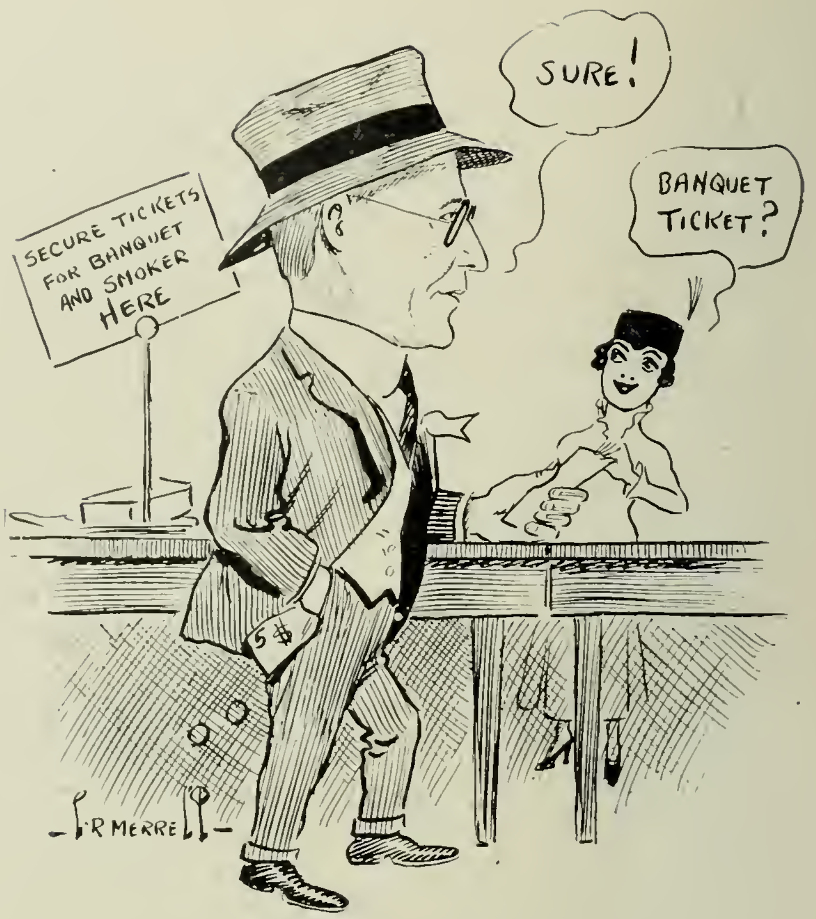
The roll of Bureau of Mines heroes, who have given up their lives to save others, now includes Joseph E. Evans, rescuer, killed at Throop, Pa., April 7, 1911; John Ferrell, killed at Cherry Valley mine, Cherry Valley, Pa., January 20, 1912; Edward Evans, killed at Rock Springs, Wyo., September 30, 1913; and L. M. Jones, killed at Barrackville, W. Va., October 20, 1916.

Mr. Jones left a wife and two children, and under the new Federal Compensation Act, Mrs. Jones will receive $420 a year during her widowhood, and on behalf of each of the children, $120 a year until the children reach the age of 18.

COPPER COMPANY'S PROFIT REACHES $4,000,000 IN MONTH

A report to the Federal Reserve Board contains the following statement:

"The enormous wealth from production of copper has some reflection in the large percentage of increase in deposits shown by the banks of Arizona, Utah, and Nevada. The profits of a single copper company in Utah are said to have reached $4,000,000 in one month."


SURE!
BANQUET TICKET?
SECURE TICKETS FOR BANQUET AND SMOKER HERE
5$
J.R. MERRELL

A CARTOONIST'S CONCEPTION OF GEO. CUSHING

at the Mining Congress convention

RICE TO STUDY PROBLEMS IN CANADIAN MINES

The Canadian Government has made arrangements with George S. Rice, chief engineer of the Bureau of Mines, to study the dangerous phenomena caused by the presence of gas in the mines of the Crow's Nest District of British Columbia. Mr. Rice has been granted a leave of absence so as to take advantage, in a private capacity, of the offer made by the Canadian Government. The Bureau also realizes that this experience is likely to be of very great value in the solving of similar problems in American mines.

METAL MINING METHODS TO BE STUDIED CLOSELY

Roy R. Horner, a mining engineer, has been selected to take charge of the investigation of metal mining methods which is to be conducted by the Bureau of Mines. His headquarters for the present will be Salt Lake City, but it is understood that his investigation will be extended later to other portions of the country. His salary is $3,600 annually.

Steel Prices Soar

High speed steels before the European War were from 60 to 80 cents a pound, depending somewhat on the maker, and the maker's name was probably an indication of the quality. After the beginning of the war prices rose to $3.00 during 1915 and during the first six months of 1916 the price was $3.40 a pound, according to F. L. Hess of the Geological Survey.

DE FACTO GOVERNMENT OF MEXICO EXPLAINS ITS MINING DECREES

Authoritative Statement Presents Mining Situation from Viewpoint of Carranza—Thousands of Americans Intensely Interested in Decrees Affecting Their Property Rights

Considerable controversy and uncertainty have arisen among American mining men in connection with the various decrees issued by the de facto government of Mexico. Owing to the fact that the American public has several hundred millions of dollars invested in mining enterprises in Mexico, a request was made at the Mexican Embassy here for a concise statement of the situation. The following semi-official statement of the situation has been furnished THE MINING CONGRESS JOURNAL, and is published in full herewith.

Under Spanish law all minerals underneath the surface were the property of the Crown and those who exploited them were required to pay a goodly percentage to the king for the privilege.

When Mexico gained her independence the minerals became the property of the nation, except coal and oil, but the payment to the government for the exploitation privilege was materially lessened.

The owner of the surface of the land does not own the mineral, and the latter is subject to denunciation by anyone, subject to payment for damage done to property of the surface owner.

The new production tax, as will be seen by the accompanying decree, is fixed at 10 per cent *ad valorem* on gold and silver and 5 per cent on copper and other metals. The old tax averaged 4½ per cent.

For purposes of comparison it may be stated that the Canadian Federal tax on production was 13 per cent before the present war, and is now understood to be considerably higher.

The old Mexican tax on mineral-bearing lands taken up under the mining law was $6 per pertenencia per annum for the first twenty-five pertenencias, and $3 for each additional pertenancia. (A pertenencia is the unit of a mining claim and equals 2½ acres.)

The new tax is graduated and becomes proportionately heavier the greater the extent of the holding, the avowed purpose being to discourage the old system of holding extensive tracts of mineral-bearing lands and preventing others from exploiting them. Many foreign companies, under the old system, held tens of thousands of acres while only developing a small percentage thereof.

That the tax is not onerous or confiscatory can be seen by a little calculation. On the first ten pertenencias or 25 acres the total annual payment is $60 Mexican, or $30 American gold. On the next 40 pertenencias it is $480 Mexican, $240 American. On the next 50 it is $900 Mexican, $450 American. On a total of 500 pentenencias, or 1,250 acres, amply sufficient for a very good-sized mine, the total annual tax is $11,040 Mexican, $5,520 American. On each 500 pertenencias in addition to the first 500 the total annual tax is $12,000 Mexican, or $6,000 American. While there are no data immediately available regarding American mining taxes, those varying according to locality, there being no Federal tax, it is believed the Mexican levy will compare favorably with those of any of the American mining States and with the taxes paid by some of the very companies that are objecting to the demands of Mexico.

DECREE OF MAY 1, 1916

The mining tax decree issued by Carranza May 1, 1916, is as follows:

Venustiano Carranza, first chief of the Constitutionalist Army, in charge of the executive power of the nation, making use of the extraordinary faculties with which I am empowered, I have seen fit to decree as follows:

Art. 1.—The mineral ores produced in the republic or in other countries are subject to the interior stamp tax, under the express provisions of the law. The tax will be in the future paid as specified below.

A.—The metals which are exported in the shape of mineral ores or earth, cyanides or sulphurets, or in any other form combined or mixed with substances which are not metals are not metals properly called, as follows:

Gold and silver at the rate of 10 per cent ad valorem.

Other metals at the rate of 5 per cent ad valorem.

The Finance Department will fix in due course, once the quotations in the foreign markets are known, the monthly rates for the payment of the tax.

B.—The taxes mentioned in the foregoing clause on metals treated in the country, which are mixed with other metals and whatever the alloy, will be reduced 20 per cent.

Art. 2.—The interior stamp tax will not be paid on the following:

A.—Gold brought to the mint to be coined, and that presented in the government of-pieces to be exchanged for silver coin at the rate of 75 centigrams of pure gold for each peso.

B—Gold or silver Mexican or foreign coins.

C—Silver exported in the shape of mineral ore, earth or powder, either in their natural state or concentrated mechanically, or in the shape of sulphurets, cyanides or smelting residues, always provided that the amount of silver contained in each does not exceed 250 grams per ton.

D—Silver and gold, which having been imported into the republic in any of the shapes mentioned above, are exported within the four following months in the shape of ingots or bars, after being subjected to metallurgical treatment in the Mexican smelters.

E—Gold and silver employed in national industry.

F—Samples of ore in their natural state which are exported as provided by the administrative regulations.

G—Copper ores in the cases where this metal is contained in a proportion below 10 per cent. and zinc ores in the cases where this metal is contained in proportion below 15 per cent.

Art. 3—The assay dues will only be paid when this operation is performed at the request of the interested parties under the law or by order of the government; the smelting dues will be paid when the ingots or bars are required to be melted for their assay or valuation; and the dues for refining and sorting will be paid when these operations are performed at the request of owners in the government offices established for that purpose. The dues mentioned in this article will be specified in the respective tariffs to be issued by the Finance Department.

Art. 4—The mining companies will be subject to the common financial legislation to govern all their acts and operations.

Art. 5—The value of the special stamps which under the laws in force, are to be affixed to the mining titles of ownership, will be $10 Mexican gold, whatever the nature of the mineral substance to be exploited.

Art. 6—The annual tax on mining ownership will be paid as follows:

ON LANDS BEARING GOLD AND SILVER ORES

A—One up to ten pertenencias, at the rate of $6 per annum per pertenencia, or $2 for each four months.

B—Eleven up to 50 pertenencias, at the rate of $12 per annum per pertenencia, or $4 for each four months.

C—Fifty-one up to 100 pertenencias, at the rate of $18 per annum per pertenencia, or $6 for each four months.

D—One hundred and one pertenencias or over, at the rate of $24 per annum per pertenencia, or $8 for each four months.

MINERAL ORES OTHER THAN GOLD OR SILVER

A—One up to 50 pertenencias, at the rate of $6 per annum per pertenencia, or $2 for each four months.

B.—Fifty-one up to 200 pertenencias, at the rate of $12 per annum per pertenencia, or $4 for each four months.

C.—Two hundred and one up to 500 pertenencias, at the rate of $18 per annum per pertenencia, or $6 for each four months.

D.—Five hundred and one pertenencias or over, at the rate of $24 per annum per pertenencia, or $8 for each four months.

Art. 7.—The rates will be raised in those cases where the pertenencias are the property of one single owner and they are located in the same mining district.

Art. 8.—The rates decreed by the government on mining will not be over two per cent on the value of mineral products other than iron or quicksilver.

Art. 9—Import dues will not be paid on zinc in the shape of ingots, pigs and the like; sulphur, alkaline cyanides, hyposulphides, or sodium, saltpeter or nitrate of potash or sodium, zinc in the shape of small sheets, in those cases where they are brought into the country to be used for the treatment of ores.

Art. 10.—All amounts due to the National Treasury under this law will be necessarily paid in Mexican gold.

TRANSITORY ARTICLES

Art. 1.—This law will go into effect from the date of its proclamation, but the rates mentioned in Article 6 will be applicable from July 1, 1916.

Art. 2.—The law of March 25, 1905; also the decree of March 1, 1915, and Articles 2, 4, 10, 11 and 12 of the law of March 27, 1897, as well as all other dispositions on the subject, contrary to the provisions of the present law, are abolished.

Art. 3.—The owners of mining properties having to make payments for taxes due will be governed as follows:

A.—The payments due before March 1, 1915, will be made in accordance with the rates in force before that date, an additional sum of 200 per cent being charged.

B.—The payments due for the period of March-July, 1915, will be made at the rate of $6 Mexican gold per pertenencia, for each of the first 25 pertenencias, and at the rate of $3 per annum for all pertenencias above that number, an additional sum of 100 per cent being charged.

C.—The payments due for the period of July-October, 1915, will be made at the rate of $6 Mexican gold per annum per pertenencia, whatever their number, an additional sum of 50 per cent being charged.

D.—The payments due for the period of November, 1915, to February, 1916, will be made at the rate of $8 Mexican gold per annum per pertenencia, an additional sum of 25 per cent being charged.

E.—The payments due for the period of March-June, 1916, will be made during this whole period in accordance with the rates specified in the decree of March 1, 1915, without additional charge.

Art. 4.—An unextendible term up to the 30th of June, 1916, is granted to pay, under the foregoing article, the amounts for the annual tax due up to the 29th of February, 1916. Should this payment not be made, caducity (lapse) will be declared.

Art. 5.—Tax payers are granted an option, once only and for the amounts unpaid up to the 29th of February, 1916, to pay same in Mexican gold or its equivalent in fiduciary money, at the rate fixed by the Monetary Commission.

Art. 6.—All taxpayers who, after March 1, 1915, should have paid any amount exceeding that specified in the transitory articles of this law shall have the right to get credit for same while making their subsequent payments.

Art. 7.—The stamp tax of five per cent on metals other than gold and silver, to which Clause A of Article 1 refers, will be levied on copper, always provided that the price of this metal is under 25 cents gold per pound in the New York market for immediate delivery. In those cases where the value of the copper exceeds 25 cents gold, but not above 30 cents, the tax will be at the rate of 6 per cent.

Art. 8.—The gold and silver metals which, without having left the country on this date, may have paid the stamp tax as provided by the decree of March 1, 1915, will pay at the custom houses the amount wanting to complete the rate specified in the present law.

Therefore, I order it to be printed, published, circulated and enforced.

Constitution and Reforms.—Given at the National Palace in Mexico, on the first day of May, nineteen hundred and sixteen.

(Signed) V. CARRANZA.

To Lic. Luis Cabrera, Secretary of State and of the Department of Finance and Public Credit—Present.

This I communicate to you for your information and other purposes.

Constitution and Reforms.—Mexico, May 1, 1916.—By order of the Secretary. The Sub-Secretary.—R. Nieto.

DECREE OF SEPTEMBER 14, 1916.

Carranza's decree of September 14, 1916, as to operating mines, is as follows:

"Venustiano Carranza, first chief of the Constitutionalist Army, in charge of the executive power of the republic, making use of the powers with which I am invested, and, whereas:

"It is a general principle of public right generally admitted, not only by legislators but also in the ordinary and daily practice of the most advanced countries, that the state must interfere, exercising such powers as belong to same, when it is required by the solidary interests, not only of the individual, but also of the country, or a humanitarian nature, either to secure their preservation or protection, or otherwise, its progressive development, thereby affording the supreme criterion to legitimatize and regulate the movement of government;

"That the interference of the state, when the solidary interests of the community are at stake, must be vested with such sufficient importance as required by the nature of said interests and the special circumstances of time and place, in order to render said interference adequate and opportune, and it must, in consequence, extend same precisely as far as the individual or corporative activity is not capable of acquiring the proposed end, in order that the state shall not interfere when there might only be at stake exclusively individual interests that do not affect the general welfare;

"That in the mining laws of Mexico, issued previously to the present decree, and the one preceding same, the working of mines was considered as pertaining to the public utility, in line with the principle hereinbefore mentioned, and said mines were granted precisely under said conditions which should have been fulfilled by maintaining a given number of laborers, in relation to the number of pertenencias granted with each title, in order that the operations might not be suspended for more than a certain given period; said utility consisting of the metalliferous veins found in the subsoil of the ground being developed for the benefit of the nation, and, in fact, that the exploitation of same might bring forth the necessary revenue in favor of the state, it being now considered very inconvenient for the mining industry and for the general industry of the country at large that this branch of the national wealth shall remain subject exclusively to the discretion of the mine owners, who might paralyze same at their will;

"That the mining law in effect, reserves in favor of the state the ownership of the mines, but, nevertheless, grants to private individuals or corporations the right of holding same, subject only to the payment of a tax, thereby abandoning to the individual initiative of the title holders the working of said mines and, at their discretion, the power to work them or maintain indefinitely the suspension of its operations;

"That said law, in addition to producing the effect of favoring only the great speculators, has made impossible the exploitation of mines by mine owners without capital, thereby concentrating all the important claims in the hands of foreign capitalists, who, rather than undertaking useful works, confine themselves to the gambling of market values, thereby bringing forth the grave inconvenience of monopolizing great numbers of claims and metalliferous veins, which are thereby excluded from fruitful exploitation in favor of the public interests;

"That in addition to the inconveniences set forth, the larger part of mine holders have created a further obstacle of grave consequence, in the present circumstances prevailing in the country, in connection with the strife that the Constitutionalist government has had to sustain, firstly, with the usurpation of Huerta, and, secondly, against the reaction which succeeded in dividing the victorious army; said obstacle consisting in the paralyzation of work at the mines, thereby leaving the larger portion of the mining laboring community without means of life, and depriving the state of the revenue ordinarily produced by said industry;

"That the behavior of the larger proportion of the mining corporations above referred to is in the present case so much more dangerous, as it tends to increase the obstacles that the government has to contend with, in order to acquire the reestablishment of order and peace, as with said behavior they tend to assist the enemies of the government in their non-patriotic work of procuring the assistance of foreign governments, requesting their interference in the national affairs, under the pretext of guaranteeing foreign interests which are not by any means in danger, and which, furthermore, this government is disposed to protect efficaciously, granting to same as many guarantees as might reasonably be expected;

"That in view of the foregoing, it is necessary to place in effect opportune measures to remedy the inconveniences set forth, taking in this sense, such steps as are required to protect the public interests, in so far as a painful experience has evidenced in an irrefutable way that the individual action left in connection with this matter to the free initiative dangerously hurts the solidary interests of the country.

"In view of all the foregoing, I have seen fit to decree as follows:

"Article first: All mine title holders are obliged to work their mines under the penalty of forfeiture, if work is suspended on same for more than two consecutive months, or during various intermittent periods totaling three months in one whole year.

"Article second: The mine title holders that might have a just cause for stopping their operations must obtain from the Department of Fomento the necessary permit for the suspension of same, which shall only be granted when the causes for the request should be evidenced, the permit for suspension shall not in any case be granted for a period of exceeding three months, unless after the expiration of same, the cause that originated the suspension for the exploitation should persist, as in this case said period shall be extended for such time as will strictly be necessary.

"Article third: The Department of Fomento after considering the allegations of the interested parties shall fix in each case, when new mining titles are granted, or for those already issued covering claims never before operated, the minimum number of laborers that must be employed by the mine title holder for the development of his claims, bearing in mind the number of hectares (pentenencias) granted for each title.

"Article fourth: The mine title holders that formerly had their mines in operation, must employ in their works as many laborers as they used to have under employment at the time of suspension of operations. Notwithstanding this, the Department of Fomento, after taking into consideration the allegations of the title holders, might alter said number of men, in line with the requirements of the works in each case.

"Article fifth: Once that the Department of Fomento has declared the forfeiture of a mine, this fact will immediately be communicated to the Department of Finance, who shall decide whether the mine involved should be placed at the disposal of the public, in order to be again denounced, or if the exploitation of same should be undertaken for account of the government, in which case a manager shall be appointed to supervise and continue the necessary working operations.

"Article sixth: This law shall become effective on the date of its publication.

"Given at the National Palace, in the City of Mexico, on the fourteenth day of the month of September, 1916. (Signed) V. Carranza."

NORTHWESTERN MINES WILL PAY $14,000,000 IN DIVIDENDS

Delegates from the Northwest to the Mining Congress Convention came to the meeting with this optimistic message:

"Delegates from Spokane, bearing credentials of the State of Washington, city of Spokane, and Northwest Mining Association, the latter representing allied mining interests of northwestern States and British Columbia, bring to this convention a tale of great prosperity.

"Dividends for 1916, from mines of Idaho and British Columbia, will closely approximate $14,000,000, of which the Coeur d'Alene district, greatest producer of lead-silver-zinc on the continent, contributes over $10,500,000 and British Columbia $3,000,000. Since records have been kept, the Coeur d'Alene district has paid $61,558,714 in dividends and British Columbia $16,578,911. Gross output for 1916 is estimated at $70,000,000, while the total gross output since discovery has approximated $500,000,000.

"This area stands today as one of the greatest producers of diversified metals in the world and, in the opinion of your delegates, the high water mark has not yet been reached. New mines are being developed and old ones revived. Wages are high and prosperity visible in every direction.

"The most important development during the past year is the fact that electrolytic smelting of zinc ores has passed the experimental stage and is now upon a commercial basis. Plants are now in operation at Trail, B. C., and at Great Falls, Mont., thus providing a greatly increase market and insuring evern greater prosperity in Northwest districts for many years to come."

LARGE NUMBER REGISTER AT MINING CONGRESS CONVENTION

Few Sessions of American Mining Congress Have Been So Well Attended As That Which Was Held in Chicago, November 13-16—Alphabetical List of Those Who Attended

Few conventions of the American Mining Congress have been so well attended as the one just held in Chicago. The list about to follow is of those who registered only. As is usually the case at such gatherings, many failed to register. The list is as follows:

Adams, Earl E., 530 First National Bank Building, Chicago; Adams, Harry C., Stega Building, Chicago; Adams, Willard C., McCormick Building, Chicago; Adams, W. T., Corinth, Miss.; Addings, Arthur, 5520 Blackstone Avenue, Chicago; Aggen, Nellie, 139 West Van Buren Street, Chicago; Alexander, I. W., 900 Lytton Building, Chicago; Allen Andrew, McCormick Building, Chicago; Andal, A. E., Okmulgee, Okla.; Anderson, B. E., Fisher Building, Chicago; Anderton, Hunter, Monadnock Building, Chicago; Andrews, R. L., Coffeyville, Kans.; Anthony, C. H., Columbus, Ohio; Arthur, A. T., Los Angeles, Cal.; Avery Colby M., Aurora, Ill.; Axell, Charles O., 4734 Kenmore Avenue, Chicago; Ayars, Chas. R., 184 Washington Street, Chicago; Ayars, S. V., Evanston, Ill.

Back, Thomas P., Canton, Ill.; Ball, Max W., Washington, D. C.; Barker, E. F., 710 W. Jackson Boulevard, Chicago, Ill.; Barnard, C. A., Gebo, Wyo.; Barry, R. H., Manhattan Building, Chicago; Baum, J. E., Jr., First National Bank Building, Chicago; Baxter, C. H., Lovett, Mich.; Beal, Carl H., Washington, D. C.; Becker, Ralph C., 302 Penn Avenue, Pittsburgh; Behan, Columbus D., 908 Rector Building, Chicago, Belford, J., Okmulgee, Okla.; Bell, Wm. S., Okmulgee, Okla.; Belt, Fred R., 2061 S. Park Avenue, Chicago; Benedict, A. B., 4834 S. Holsted Street, Chicago; Bent, E. T., 915 Old Colony Building, Chicago; Berry, W. B., Okmulgee, Okla.; Bevan, Arthur, University of Chicago; Bevan, John F., Pottsville, Pa.; Binder, G. A., 508 Fisher Building, Chicago; Bischoff, W. E., 507 S. Clinton Street, Chicago; Birdseye, F. W., 516 Marquette Building, Chicago; Bivens, B. W., Cranbrook, B. C.; Bixby, W. W., Spokane, Wash.; Blake, J. Garfield, 807 Grand Avenue, Chicago; Blake, R. P., 137 S. Fifth Street, Philadelphia; Blaylock, D. W., Harrisburg, Ill.; Blair, Alexander, Jr., Baskett, Ky.; Blakely, Merle F., Okmulgee, Okla.; Blakely, Thurston A., Okmulgee, Okla.; Blakely, T. T., Okmulgee, Okla.; Blish, M. R., 122 S. Michigan Avenue, Chicago; Bogle, Walter S., 343 S. Dearborn Street, Chicago; Boberg, Chas. P., 710 W. Jackson Boulevard, Chicago; Bolger, Edwin S., Altoona, Pa.; Bonsit, R. S., Indianapolis; Boess, F. E., 225 E. Twenty-second Street, Chicago; Booher, James M., 6743 Evans Avenue, Chicago; Boon, E. E., Pittsburgh, Pa.; Boore, Wm. A., Union Stock Yards, Chicago; Borroughs, W. L., Marquette Building, Chicago; Bowen, George E., 1247 Marquette Building, Chicago; Bowman, N. K., Canton, Ohio; Brande, L. L., Holsted Street and Forty-eighth Place, Chicago; Brede, Martin H., 824 Metropolitan Life Building, Minneapolis; Bredge, Norman, Los Angeles, Cal.; Bridge, Josiah, 6031 E. Wisconsin Avenue, Chicago; Bright, Samuel, Beggs, Okla.; Brink, C. R., 537 E. Thirty-ninth Street, Chicago; Brock, John L., Okmulgee, Okla.; Brodaw, Albert D., 2023 E. Seventy-second Street, Chicago (University of Chicago); Brown, Geo. R., Okmulgee, Okla.; Brown, J. Rogers, 205 W. Monroe, Chicago; Brown, John W., 415 Hazel Avenue, Highland Park, Ill.; Browning, O. E., Benton, Ill.; Brunstead, Dale, 1807 McCormick Building, Chicago; Budd, H. S., 1505 Peoples Gas Building, Chicago; Bugg, Chas. E., Carnelain Bay, Cal.; Bundy, W. A., Marion, Ill.; Buness, W. S., 1200 W. Harrison Street, Chicago; Burchard, M. N., 360 E. Fifty-fifth Street, Chicago, Burgower, M., 708 Dearborn Street, Chicago; Burnham, A. L., Joplin, Mo.; Butler, Rush, Alburquerque, N. Mex.; Byrd, H. W., Chicago, Ill.; Byers, Henry N., Bolivar, Pa.

Cady, Gilbert H., 7415 Parnell Avenue, Chicago; Callery, Phil., Pittsburg, Kans.; Callbreath, J. T., Washington, D. C.; Cameron, W. D., Monadnock Building, Chicago; Cameron, W. H., National Safety Council, Chicago; Campbell, Gordon, Winnemucca, Nev.; Carpenter, Everett, Bartlesville, Okla.; Case, M. E., Peoria, Ill.; Catterline, S. M., 1218 Boyles Street, Pittsburgh, Pa.; Chambers, Grant, Okmulgee, Okla.; Chamberlain, E., 2623 Calumet Street, Chicago; Chambers, T. W., Spartanburg, S. C.; Chance, H. M., Philadelphia; Chaney, Ralph W., University of Chicago; Chrisholm, C. B., Okmulgee, Okla.; Christman, Edward, Massillon, Ohio; Claggett, J. H. M., 605 Old Colony Building, Chicago; Clancy, T. A., Milwaukee, Wis.; Clarkson, John T., Albia, Iowa; Claybourne, Colin W., 6120 Eberhart Avenue, Chicago; Clymer, R. W., 1220 Okmulgee; Cold, A. A., Box 703, Reno, Nev.; Colbert, Oak, Oklahoma City, Okla.; Cole, Robert C., 1505 Peoples Gas Building, Chicago; Coley, J. H., Rochelle, Ill.; Collins, George E., 414 Boston Building, Denver; Comstock, Elting H., School of Mines, Minneapolis; Conever, Robert F., Custer, S. D.; Conover, A. B., 165 W. Lake Street, Chicago; Coolidge, E. B., Marden, Mont.; Copiegner, C. W., Belleville, Ill.; Cooke, E. M., Galena, Kans.; Cottrell, E., Okmulgee, Okla.; Crane, W. R., Penn. State College; Crawford, A. W., Hillsboro, Ill.; Crawford, G. N., Jr., Fisher Building, Chicago; Crawford, L. F., 2218 Farmers Bank, Pittsburgh, Pa.; Crites, C. H., Okmulgee, Okla.; Crosby, Geo. H., Duluth, Minn.; Crosby, G. H., Jr., Crosby, Minn.; Crossinger, A. J., Okmulgee, Okla.; Crume, Wm. H., Okmulgee, Okla.; Cunningham, F. W., 821 Lake Street, Oak Park, Ill.; Cushing, Geo. H., Chicago, Ill.; Cutcher, E. P., 163 W. Washington, Chicago.

David, Wylie B., St. Louis, Mo.; Davis, C. E., Chicago; DeArmit, W. P., Pittsburgh, Pa.; Dagne, S. M., 6 N. Clark Street, Chicago; Davis, Ray, Okmulgee, Okla.; Dalrymple, Denver, Colo.; Day, David T., 1333 E. Washington Street, Chicago; Dallis, Okmulgee, Okla.; Day, Edward B., 302 Penn Avenue, Pittsburgh, Pa.; Dana, C. T., St. Louis, Mo.; Dean, Wm. T., Monadnock Building, Chicago; Dant, H. R., 842 Marine Bank Building, Buffalo, N. Y.; Dering, J. K., McCormick Building, Chicago; Dering, Chas. L., Old Colony Building, Chicago; Denniston, W. T., 1838 Transportation Building, Chicago; DeNeefe, W. H., Monadnock Building, Chicago; Delano, L. A., Bonne Terre, Mo.; DeSollar, Tenney C., Hancock, Mich.; Detrick, H. C., Okmulgee, Okla.; Devlin, Thomas H., Assumption, Ill.; DeWolf, F. W., Urbana, Ill.; DeWolf, DeWitt C., Seymour, Iowa; Dick, R. & G., Ltd., 63 W. Lake Street, Chicago; Dill, W. H., Morris, Okla.; Dobler, C. R., 1228 Elmdale Avenue, Chicago; Donald, Jas., 247 Monadnock Building, Chicago; Dougall, C. F., 1433 Sherman Avenue, Chicago; Donovan, F. W., 710 Security Building, Minneapolis; Dowie, E. J., 1226 La Salle Street Station, N. Y. Cent. R. R.; Drummet, Wm. H., Houston, Tex.; Drummond, R. Lee, Dewar, Okla.; Drummond, Walter C., 70 E. Forty-eighth Street, Chicago; Duggan, H., 1700 Old Colony Building, Chicago; Dummit, Dr. T. A., Needles, Cal., and Dummit, Iowa; Dunlap, Frank, 219 W. Adams Street; Dunlop, John, 414 Columbia Terrace, Peoria, Ill.; Dunleson, H. H., Odessa, Mo.; Duon, J. E., Monadnock Building, Chicago.

Earle, John H., 2023 S. Michigan Avenue, Chicago; Easby, Paul H., Webb City, Mo.; Eastman, C. A., 1228 Gas Building, Chicago; Ede, J. A., La Salle, Ill.; Ellston, George O., Benton, Ill.; Elmer, Robt. E., U. S. S. *Wisconsin;* Encan, Chas., Pottsville, Pa.; Enesin, John, 848 Lakeside Place, Chicago; Entorf, Wm. F., Amboy, Ill.; Evans, J. E., 343 S. Dearborn Street, Chicago; Evans, T. L., Lockman, Iowa; Evensmith, Hansen, Fargo, N. D., Duluth, Minn.

Fabian, Francis G., 1462 Wesley Avenue, Evanston, Ill.; Fancher, A. N., Bay City, Mich.; Farnsworth, A. G., 1003 Vine Street, Winnetka, Ill.; Farnham, S. W., 4834 Halsted Street, Chicago; Farris, Ed., Okmulgee, Okla.; Faulkner, J. P., Kusa, Okla.; Fay, Albert H., Washington, D. C.; Feeney, John E., Okmulgee, Okla.; Fenn, Edward L., 1005 McCormick Building, Chicago; Fender, R. S., Okmulgee, Okla.; Ferguson, W. A., Monadnock Building, Chicago; Fesing, H. W., Houghton, Mich.; Field, S. Linn, Okmulgee, Okla.; Fisher, Frank A., Springfield; Flack, E. W., 121 E. Fifty-sixth Street, Chicago; Flaherty, John T., 1257 Devon Avenue, Chicago; Fletcher, Carl J., Indianapolis; Foley, Frank J., Westinghouse Electric Co., Pittsburgh, Pa.; Forbes, F. H., Okmulgee, Okla.; Forbes, J. B., 1223 Peoples Gas Building, Chicago; Forester, Robert J., DuQuoin, Ill.; Fowler, E. D., Ottumma, Iowa; Francis, R. S., Okmulgee, Okla.; Francis, Dr. Wm. H., 6638 Normal Boulevard, Chicago; Fritch, H. F., Okmulgee, Okla.; Frutchey, M. P., 1505 Peoples Gas Bldg., Chicago;

Gallaher, J. F., New York City; Gamble, J. G., Des Moines, Iowa; Gann, Thos. M., Knoxville, Tenn.; Gannon, M. H., Dillon, Mont.; Gardner, James W., 2004 N. Park Avenue, Chicago; Gardner, R. A., Alhambra, Cal.; Gardiner, R. W., Washington, D. C.; Gaynean, R. O., Thirty-ninth and Stewart Streets, Chicago; Gilbert, H. M., 6007 Rhodes, Chicago; Gilbert, J. N., San Francisco; Geraldine, Dion, 1247 Marquette Building, Chicago; Gerlach, O., Danville, Ill.; Gibbs, Rev. Geo. C., Okmulgee, Okla.; Giles, G. L., Okmulgee, Okla.; Goldsmith, M., 906 Heyworth Building, Chicago; Good, J. L., Cleveland, Ohio; Gowhug, T. A., Marquette, Mich.; Granberg, H. O., 1004 Michigan Avenue, Oskosh, Wis.; Grant, B. E., 1735 Monadnock Building, Chicago; Grasty, John Sharshall, Charlottsville, Va.; Gray, E. M., Des Moines, Iowa; Greeley, Sidney T., Winnetka, Ill.; Green, Arthur C., Chicago, care of Goodman Mfg. Co.; Green, Vivian, Murray, Idaho; Greenlaw, F. H., 600 Fullerton Building, St. Louis; Greenlee, W. B., 662 W. Twelfth Street, Chicago; Grier, D. W., Okmulgee, Okla.; Griffin, Frank, 705 W. Third Street, Okmulgee; Griffin, H. W., Okmulgee, Okla.; Grorze, J. C., 1010 Fisher Building, Chicago; Grossberg, Jacob G., 72 W. Adams Street, Chicago; Gulley, Ransom, Little Rock.

Hadley, S. A., Dwight Building, Kansas City, Mo.; Hale, Sydney A., 803 Transportation Building, Chicago; Hall, Wm., Springfield, Ill.; Halberstadt, Baird, Pottsville, Pa.; Halberstadt, G. H., Pottsville, Pa.; Hamer, W. D., 712 E. Thirty-third Street, Indianapolis; Hampton, L. W., Okmulgee, Okla.; Harlin, Robt. H., 2509 Jackson Street, Seattle, Wash.; Harrer, A. C., 9618 One hundred and Six-A Avenue, Edmonton, Canada; Harrison, A. H., 165 W. Lake Street, Chicago, Ill.; Harrison, L. H., Charleston, W. Va.; Hart, Harry, Okmulgee, Okla.; Hartman, John G., 106 La Salle Street, Chicago; Harwood, F. H., 1709 Fisher Building, Chicago; Hatfield, Chas. F., 614 Commercial Building, St. Louis; Hawgood, H., Los Angeles, Cal.; Hazeltine, Roy S., Box 15, Mansfield, Ohio; Hiskok, F. S., 927 Marquette Building; Hegeler, Julian W., Danville, Ill.; Henley, W. E., Birmingham, Ala.; Hensley, J. W., Okmulgee, Okla.; Hensley, Wayne, Okmulgee, Okla.; Henin, C., Henryetta, Okla.; Harrington, Geo. B., McCormick Building, Chicago; Hill, F. S., Monadnock Building, Chicago; Hillix, F., 1200 W. Harrison Street, Chicago; Hinkle, C. R., Madison, Wis.; Hiscox, Morton, 1535 Monadnock Building, Chicago; Haberstroh, H. N., 3044 Broadway, Chicago; Hodge, John, 710 Security Building, Minneapolis; Heen, W. M., Houghton, Mich.; Hoffman, R. L., Schenectady, N. Y.; Hogan, E. L., Marquette Building, Chicago; Hooey, E. M., Chicago, Ill.; Holl, Julius S., 5940 S. Park Avenue, Chicago; Holland, W. E., Highland

Park, Ill.; Honnold, T. C., 2017 Fisher Building, Chicago; Hopkins, H. H., 164 W. Dearborn Street, Chicago; Hopkins, N. O., Okmulgee, Okla.; Hopton, John, Okmulgee, Okla.; O'Hoonett, Carl J., Henryetta, Okla.; Horton, Harry G., 1807 McCormick Building, Chicago; Houser, J. N., Mascot, Tenn.; Howat, Alexander, 207 West Park, Pittsburg, Kans.; Howell, Francis M., 1327 Chicago Avenue, Evanston, Ill.; Huberl, Rev. A., Okmulgee, Okla.; Hughes, Andrew F., 323 W. Sixty-ninth, Chicago, Ill.; Hulings, Fred W., Morris, Okla.; Humphrey, J. M., Wilkes Barre, Pa.; Hunner, Earl E., Duluth, Minn.; Hunt, Albert C., Wagonek, Okla.; Hurd, J. D., Los Angeles, Cal.

Ireland, R. J., Amityville, N. Y.; Ives, L. E., Tenth Avenue and Thirty-sixth Street, New York.

Jackson, C. W., Peoples Gas Building, Chicago; Jackson, Walter M., 454 E. Forty-sixth Street, Chicago; James, Garrett B., 5124 Hyde Park Boulevard, Chicago; Jenkins, S. T., 1501 Boatmans Park, St. Louis, Mo.; Jenkins, Thomas M., St. Louis, Mo.; Jeremiah, Thos., Willesville, Ill.; Johnson, Ernest C., First National Bank Building, Chicago; Johnson, H. H., Monadnock Building, Chicago; Johnson, C. R., Chicago, Ill.; Johnson, W. J., 1114 Union Bank, Pittsburgh, Pa.; Johnson, Wm., Vincennes, Ind.; Jorgensen, F. F., Gillespie, Ill.

Kahn, Karl M., 153 Institute Place, Chicago; Kaufman, J. C., 175 W. Jackson Boulevard; Kay, F. H., Urbana, Ill.; Kelly, James J., 7 S. Dearborn Street, Chicago; Kelly, W. J., 4601 N. Western Avenue, Chicago; Kennedy, D. C., Charleston, W. Va.; Kennedy, Thomas, Hazelton, Pa.; Keiflein, J. L., Chicago, Ill.; King, Dr. J. Edward, 1216 First National Bank Building, Chicago; Kinney, W. D. M., 507 Outlook Building, Columbus, Ohio; Kinney, V. E., Okmulgee, Okla.; Kinyon, Alonzo G., 1903 McCormack Building, Chicago; Kirby, Grady, Tulsa, Okla.; Kirk, S. B., Peoples Gas Building, Chicago; Keller, F. L., Okmulgee, Okla.; Kellogg, C. H., Henryetta, Okla.; Kittoe, Richard D., 1638 Harrison Street.; Kettleborough, Charles, State House, Indianapolis; Klutas, J. H., 5041 Grand Boulevard, Chicago; Knox, J. K., 5520 Blackstone Avenue, Chicago; Koering, Ben R., 511 Hammond Building, Detroit; Kolsem, J. C., Terre Haute, Ind.; Konsberg, A. V., 226 S. LaSalle Street, Chicago; Karcher, B. F., Okmulgee, Okla.; Krehbiel, Fred O., 1712 Marquette Building, Chicago.

Layfield, E. N., 1735 Monadnock Building, Chicago; Leib, Chas. H., 812 Home Inst. Building, Chicago; La Fleur, L. E., 708 W. Jackson Boulevard, Chicago; Lambert, Dr. O. A., Okmulgee, Okla.; Lane, Alton W., 1430 Elmwood Avenue, Evanston, Ill.; Laney, S. W., Okmulgee, Okla.; LaSarre, J. G., 817 Dearborn Avenue, Chicago; Leach, G. A., M.D., Morris, Ill.; Lemmon, T. A., 407 McCormick Building, Chicago; Leslie, E. H., 300 Fisher Building, Chicago; Lettsome, A. R., 1521 Lytton Building, Chicago; Lewis, Otis, Okmulgee, Okla.; Lewis, T. L., Charleston, W. Va.; Lihme, C. B., 1200 Lake Shore Drive, Chicago; Logan, W. H., 320 S. Fess Avenue, Bloomington, Ind.; Long, Lee, Dante, Va.; Longhenry, Edw., G., Benton, Wis.; Loomis, H. E., Cleveland, Ohio; Lot, Edward G., 908 Rector Building, Chicago; Lott, Geo. M., McCormick Building, Chicago.

McAlpine, J. W., Oklahoma City, Okla., Hanover, N. Mex.; McBeth, C. S., Denver, Colo.; McCallum, Alpheus, 1544 Randolph Street, Chicago; McCargar, D. M., 277 Sherbourne, Toronto; McCarthy, James W., 2122½ Sycamore Avenue, Milwaukee; McCarthy, M., Chicago, Ill.; McClave, Mrs. James M., 1150 Cook Street, Denver; McClave, James M., 1150 Cook St., Denver, and 922 Eighteenth Street, Denver; McCoy, J. E., Knoxville, Tenn.; McCrindle, David, 1123 St. Vincent Avenue, LaSalle, Ill.; McCulloch, James W., Okmulgee Okla.; McDonald, E. T., Milwaukee, Wis.; McKee, Dr. Victor, Henryetta, Okla.; Moderwell, Chas. M., 1060 McCormick Building, Chicago; McDowell, J. C., 1321 Farmers Bank Building, Chicago; McGarry, E. C., 1388 S. Ninth, Salt Lake City; McGrath, M. H., Lost Creek, Pa.; McGuire, Wm. A., Ocala, Fla.; McKee, C. K., Pittsburgh, Pa.; McKenzie, Paul O., 1922 Peoples Gas Building, Chicago; McLeod, Angus, 5520 Blackstone Avenue, Chicago; McNair, F. W., Houghton, Mich.; McNeill, C. A., Columbus, Kans.; McIntosh, R. M., 3210 Arthington, Chicago; McCune, S. W., Jr., Monadnock Building, Chicago; McTurk, W. R., Philadelphia, Pa.; MacBumby, J. L., Nineteenth Street and Allegheny Avenue, Philadelphia; McFarland, J. R., 516 Marquette Building, Chicago; MacKay, B. Reid, Ottawa, Can.; McPherson, John, Bolivar, Pa.; Maitland, Alexander, Niguanee, Mich.; Maloney, A. J., 407 McCormick Building, Chicago; Manley, F. V., Houston, Tex.; Manning, Van H., Washington, D. C.; Margrove, Frank, Reno, Nev.; Mariner, F. E., Gull Point, Fla.; Marsh, S. J., Quesnel, B. C.; Marshell, Jno. R., Ottawa, Can.; Martin, Bert. H., Okmulgee, Okla.; Martin, Charlie, Kusa, Okla.; Martin, Emer, 313 McCormick Building, Chicago; Matthews, James, Shenandoah, Pa.; Matthews, C. H., Marquette, Mich.; Matthews, W. W., Coffeyville, Kans.; Meagher, Harvey E., 1922 Gas Building, Chicago; Means, C. M., Pittsburgh, Pa.; Meath, J. J. & Co., 106 LaSalle Street, Chicago; Melcher, Chas. W., 1505 Gas Building, Chicago Menny, A. J., 422 First Avenue, Pittsburgh, Pa.; Metcalf, H. E., 422 First Avenue, Pittsburgh, Pa.; Meyer, J. E., Box 653, Salt Lake City; Meyer, J. W., 1715 Walnut Avenue, Wilmette, Ill.; Mikesell, A. S., 139 W. Van Buren Street, Chicago; Millard, B. F., Valdez, Alaska; Miller, A. A., 2023 Michigan Avenue, Chicago; Miller, Harry, Okmulgee, Okla.; Miller, Rice, Hillsboro, Ill.; Miller, Roy A., 2023 S. Michigan Avenue, Chicago; Miller, W. A., Cincinnati, Ohio; Miller, W. C., Henryetta, Okla.; Milton, T., 140 S. Dearborn Street, Chicago; Minier H. E., Lawson, Colo.; Minnegren, J. A., 836 S. Michigan Avenue, Chicago; Mitchell, A., 203 S. Dearborn Street, Chicago; Mitchener, Dr. W. C., Okmulgee, Okla.; Moe, C. J., Hamilton Club, Zapopan Mining Co., LaYasca, Mexico; Moltz, M. A., Okmulgee, Okla.; Moncrieff, J. N., La Crosse, Wis.; Monroe Calculating Machine Co., 330 W. Monroe Street, Chicago; Moody, O. E., care of Press Club, Chicago; Moore, John M., Okmulgee, Okla.; Moore, W. E., Cranbrook, B. C.; Moore, W. F., Okmulgee, Okla.; Moroney, J. J., Okmulgee, Okla.; Mordue, Thos. N., 817 Peoples Gas Building, Chicago; Morse, T. V., 129 E. Garfield Avenue, Chicago; Moorshead, A. J., Karpin Building, Chicago, Ill.; Morrison, A. Cressy, 30 E. Forty-second Street, New York; Morton, P. K., Okmulgee, Okla.; Mott, F. S., Charleston, W. Va.; Mullin, J., Lockport, Ill.; Murray, James H., 345 Insurance Exchange, Chicago.

Needham, Jas., 1368 Fullerton Avenue, Chicago; Neff, J. T., 6224 Palatine Avenue, Seattle; Nelson, P. A., 165 W. Lake St., Chicago; Newell, W. A., Okmulgee, Okla.; Newbaker, E. J., Wilkes Barre, Pa.; Newman, L. A. Okmulgee, Okla.; Nichols, Henry W., 1645 E. Sixty-eighth Street, Chicago; Nill, William H., Massillon, Ohio; Noble, Ralph E., Twenty-seventh and Shields Avenues, Chicago; Nordale, Carleton E., Minneapolis, Minn.; Nordberg, C. V., Electric Building, Butte, Mont.; Norman, Sidney, Spokane, Wash.; Norton, Alex. A., 610 Ashland Block, Chicago; Norton, Edward G., 6023 Vernon Avenue, Chicago; Norwood, J., Des Moines, Iowa.

O'Brien, T. H., Dawson, N. Mex.; O'Brien, J. H., Marquette Building, Chicago; Obcamp, W. D., Lincoln, Ill.; O'Connor, F. B., 1922 Gas Building, Chicago; Osgood, Samuel W., 1229 First National Bank Building, Chicago; Owen, R. C., Henryetta, Okla.

Pace, T. J., East Pittsburgh, Pa.; Pancoast, A. L., Okmulgee, Okla.; Pank, Alfred, Chicago; Pardee, T., 613 Marquette Building, Chicago; Parks, C. A., 2023 Michigan Avenue, Chicago; Parks, Edw. W., Wilkes Barre, Pa.; Parsons, Floyd W., Tenth Avenue and Thirty-sixth Street, New York; Parson, Harry W., 1734 First National Bank, Chicago; Paterson, Gordon, Duluth, Minn.; Payne, Henry Mace, 3715 Woolworth Building, New York City; Peterson, A. W., Haynes, N. D.; Pearce, E. L., Marquette, Mich.; Pette, W. R., 419 W. Twelfth Street, Chicago; Payton, J. T., Marquette Building, Chicago; Philips, N. A., 6301 Gunnison Street, Chicago; Phillips, W. E., Okmulgee, Okla.; Pickering, Harvie, Okmulgee, Okla.; Pickering, Len, Okmulgee, Okla.; Pill, John R., Corona, Ala.; Planck, C. E., 1505 Peoples Gas Building, Chicago; Pegue, Joseph E., Northwestern University, Evanston, Ill.; Pollock, A. W., Antrom, Pa.; Pope, George, Hartford, Conn.; Porter, Robert J., Okmulgee, Okla.; Pendergast, F. A., 1323 Rockefeller Building, Cleveland, Ohio; Preston, A. R., Okmulgee, Okla.; Price, Max T., Charleston, W. Va.; Price, Stanley, 510 Sycamore, Coffeyville, Kans.; Pruden, H. B., 1903 McCormick Building, Chicago; Purdue, A. H., Nashville, Tenn.

Quong, Harry, Okmulgee, Okla.

Rabon, Sam, Henryetta, Okla.; Rannd, W. E., 1900 Republic Building, Chicago; Ranker, J. D., Chicago, Ill.; Raftery, Thomas J., 345 Old Colony Building, Chicago; Rasdon, W. W., Albuquerque, N. Mex.; Ray, H. C., University of Pittsburgh, Pa.; Read, Thomas W., 55 Wall Street, New York; Raymond, M. W., 710 W. Jackson Boulevard, Chicago; Redden, H. R. Ainling Bros. Co., St. Louis, Mo.; Reed, M. C., 1506 E. Sixty-third Place, Chicago; Reese, E. A., Hubbard, Iowa; Reese, John P., Gilespie, Ill.; Reynolds, C. P., Henryetta, Okla.; Rhodehamel, G. C., 601 Hyde Block, Spokane, Wash.; Rice, Geo. S., Washington, D. C.; Richardson, Evans T., Oatman, Ariz.; Richards, J. T., 5441 Kimbark Avenue, Chicago; Richards, T. S., 9545 S. Robey Street, Chicago; Richards, M. E., Crystal Falls, Mich.; Rittman, Walter F., Pittsburgh, Pa.; Roach, Chas., Okmulgee, Okla.; Robb, David, West Terre Dante, Ind.; Roberts, C. M., Okmulgee, Okla.; Roberts, Warren R., McCormick Building, Chicago; Robinson, J. H., Prescott, Ariz.; Robirds, Edw. E., 507 S. Clinton Street, Chicago; Rodgers, E. Ellsworth, Cranbrook, B. C.; Rogers, W. J., Pottsville, Pa.; Rosenthal, M. G., Mining World, Chicago; Rosenthal, S., Mining World, Chicago; Rothrech, E. Paul, 6031 Ellis Avenue, Chicago; Rowell, H. C., Valparaiso, Ind.; Ruhl, Otto, Joplin, Mo.; Rupp, Burton S., 209 Boston Building, Chicago.

Sackrison, E. S., 125 W. Monroe Street, Chicago; Saeger, W. C., 711 Cuyahoga Building, Cleveland Ohio; Sager, F. W., 458 McCormick Building, Chicago; Sample, Joseph E., Hill Building, New York, N. Y.; Sanderson, W. C., Henryetta, Okla.; Sands, H. T., 1052 G. & E. Building, Denver; Savage, G. M., 75 Ruggery Building, Columbus, Ohio; Sawtelle, E. S., Cincinnati; Sayers, W. W., 4041 Ellis Avenue, Chicago; Schaffer, W., 1530 Lee Street, Charleston, W. Va.; Schmick, W. L., 908 Wainwright Building, St. Louis, Mo.; Schmitzel, Henry, Deadwood, S. D.; Scholz, Carl, 139 W. Van Buren, Chicago; Scholz, O. F., Lacon, Ill.; Schnyer, C. R., 1379 E. Fifth-seventh Street, Chicago; Schuber, A. R., 1510 Morse Avenue, Chicago; Scollard, Michael, Indianapolis, Ind.; Scott, O. G., 327 S. Fifth Street, Springfield, Ill.; W. F. Scott, 2001 Prairie Avenue, Chicago; Seaman, H. W., 719 Rookery, Chicago; Search, H. M., Bethlehem, Pa.; Sebastian, Don B., La Salle Station, Chicago, care of C. R. I. & P. R. R.; Sebring, T., Nowata, Okla.; Seeber, R. R., Winona, Mich.; Seamann, Henry I., Denver, Colo.; Semple, F. H., Monadnock Building, Chicago; Seidl, Hans E., Tenth Floor, Fisher Building, Chicago; Sercombe, Parker H., 619 S. Fifteenth Avenue, Maywood, Ill.; Seymour, Charles M., Knoxville, Tenn.; Schakelford, W. R., Webb City, Mo.; Sharp, J. H., 829 Hearst Building, San Francisco, Cal.; Shaw, R. A., Peoples Gas Building, Chicago; Sherman, A. H., Monadnock Building, Chicago; Sherwood, M. W., 1010 Fisher Building, Chicago; Shick, Roy, Okmulgee, Okla.; Shive, S. S., 332 S. Michigan Avenue, Chicago; Scheck, Dave, Okmulgee, Okla.; Short, Frank H., Fresno, Cal.; Simpson, George N., 4834 S. Halsted Street, Chicago; Short, R. P., Okmulgee, Okla.; Simpson, J. S., Windber, Pa.; Sisley, Geo. E., 517 Monadnock Building, Chicago; Skidmore, W. H., Columbis, Kans.; Skinner, A. P. W., 507 Postal Telegraph Building, Chicago; Skinner, Ernest, Okmulgee, Okla.; Slingheff, W. H., 165 W. Lake Street, Chicago; Small, Harry H., 4834 Halsted Street, Chicago; Smith, C. T., Okmulgee, Okla.; Smith, Hugh Calvin, First National Bank Building, Chicago; Smith, H. L., Urbana, Ill.; Smith, Forrest B., 5861 Winthrop Avenue, Chicago; Smith, George Otis, Washington, D. C.; Smith, L. H., 915 Old Colony Building, Chicago; Smith, Thos. D., Pottsville, Pa.; Snyder, H. R., Milwaukee, Wis.; Snyder, W. J., Brazil, Ind.; Somerville, Thos., 1550 E. Sixty-fourth Street, Chicago; Soper, E. K., Moscow, Idaho; Stander, Henricus J., Brunswick, Ga.; Straight, Mrs. Emma, La Salle Hotel; Straight, W. W., Jr., Cleveland, Ohio; Stank, W. L., 120 Broadway, Chicago; Steidle, Edward, Washington, D. C.; Stock, H. H., Urbana, Ill.; Stone, E. M., 427 S. Seventeenth Avenue, Maywood, Ill.; Strenll, C. N., Salt Lake City; Stronck, H. N., Gas Building, Chicago; Swain, Orlando, Okmulgee, Okla.; Swain, John D., Gas Building, Chicago; Swart, W. G., Duluth, Minn.; Sweeney, C. G., Des Moines, Iowa.

Tapper, W. R., 1206 Edison Building, Chicago; Talmadge, James E., Salt Lake City; Tapper, C. A., 516 Monadnock Building, Chicago; Tayloe, B. B., Catlin, Ill.; Taylor, F. W., Denver, Colo.; Taylor, H. S., Seattle, Wash.; Taylor, S. A., 506 Second National Bank Building, Pittsburgh, Pa.; Terrell, A. D., 1111 Marquette Building, Chicago; Terry, T. W., Okmulgee, Okla.; Thomas, Eugene, Osbourne, Idaho; Thomas, E. P., 63 W. Lake St., Chicago; Thompson, J. N., Beggs, Okla.; Thompson, R. B., Okmulgee, Okla.; Thompson, Wm., Beggs, Okla.; Thurtell, B. W., 4048 N. Crawford Avenue, Chicago; Titus, Louis, Balboa Building, San Francisco, Cal.; Traber, Herman L., Muskogee, Okla.; Trager, Earl A., 714 W. Oak Street, South Bend, Ind.; Tratman, E. E. R., 1144 Monadnock Block, Chicago; Trontman, H. E., 820 Old Colony Building, Chicago; Trumbull, L. W., Cheyenne, Wyo.; Tubby, C. W., 703 Commerce Building, St. Paul, Minn.; Tucker, W. C., Binham, Ky.; Tuthill, R. J., Miami, Okla.; Tuttle, Jno. A., Harrisburg, Ill.

Upham, Mrs. Nellie C., 128 Maryland Avenue, Washington, D. C.; Unger, Wm. S., 3344 Broadway, Chicago.

Veatch, C. A., 508 Fisher Building, Chicago; Vignean, Jos. J., Pittsburgh, Pa.; Vignos, Majar A., Canton, Ohio; Votaw, H. J., 4843 Prairie Avenue, Chicago.

Wagner, P. A., Southern Hotel, Chicago; Waite, F. E., DuBois, Pa.; Walcott, Albert, 716 S. Kedze Avenue, Chicago; Walker, E. Elwood, Okmulgee, Okla.; Wallene, F. O., Minneapolis, Minn.; Walsh, H. P., Gas Building, Chicago; Ward, H. B., University of Chicago; Ward, R., Morris, Okla.; Warford, N. L., 1903 McCormick Building, Chicago; Warren, L. G., 910 Summit Avenue, Milwaukee, Wis.; Weeks, F., Blocker, Okla.; Walter, Hamilton, 1507 Hinman Avenue, Evanston, Ill.; Wells, Iverson C., 501 Monadnock Block, Chicago; Wentz, J. A., Chariton, Iowa; West, S. A., Old Colony Building, Chicago; West, W. C., Peoples Gas Building, Chicago; Wertzen, John, Coffeyville, Kans.; Weitzel, E. H., Pueblo, Colo.; Wetmore, L. R., Okmulgee, Okla.; White, C. P., 415 Marion Building, Cleveland, Ohio; White, F. Wallace, Bourne Baker Co., Oregon; White, E. E., Peoples Gas Building, Chicago; White, F. C., Morgantown, W. Va.; Whitehead, John M., Janesville, Wis.; Whitenton, Robt. T., Henryetta, Okla.; Whyte, Geo. S., Kenosha, Wis.; Wiederanders, E. O., 1427 E. Sixty-sixth Place, Chicago; Williams, David, 1112 Manhattan Building, Chicago; Williams, J. A., Chicago, Ill.; Williams, J. E., Streator, Ill.; Williams, Prof. S. N., 734 N. Fairoaks Avenue, Chicago; Williamson, F. O., Old Colony Building, Chicago; Willis, Charles F., Tucson, Ariz.; Wilmot, W. G., Chicago, Ill.; Wilms, O. N., 709 Barry Avenue, Chicago; Wilson, H. M., Pittsburgh, Pa.; Wilson, R. J., Marissa, Ill.; Winfrey, A. R., Okmulgee, Okla.; Wing, David L., Washington, D. C.; Wolcott, Herbert B., 305 Miners Bank, Joplin, Mo.; Woodbridge, C. M., 1714 E. Fifty-fifth Street, Chicago; Woodford, R. W., Cleveland, Ohio; Wootton, Paul, Washington, D. C.; Work, Fitzjames, Okmulgee, Okla.; Worth, D., Kingman, Ariz.; Worth, F. C., 4645 Maiden Street, Chicago; Wright, F. P., Bevie, Ky.; Wright, William, 517 Drexel Building, Philadelphia; Wright, W. H., 3234 Park Avenue, Chicago; Wuerzinger, T. M., Rector Building, Chicago; Wuerzinger, H. C., Rector Bldg., Chicago.

Yeaton, Walter J., 6031 Ellis Avenue, Chicago; Young, C. M., Urbana, Ill.; Young, W. M., Beggs, Okla.; Young, King H., Washington, D. C.

Zeon, E. N., Morganstown, W. Va.

Esmond, T. C., Jerome, Ariz.

Von Schlegell, T., Peoples Gas Building, Chicago.

URGES ACTION ON BILL ENCOURAGING RESEARCH

"A step which may well bring most valuable and far-reaching results is that sought by a bill which has been before Congress for several years, which aims at the national encouragement of research. It was introduced and supported by the Association of Land Grant Colleges of the separate states and it calls for the establishment of an experiment station in each with an annual Federal appropriation of $15,000. There seemed good precedent for such a move. A very similar plan has been carried out in the state agricultural stations and by many states additional support has been given to this work, so that the country as a whole has long seen the good results. It was thought that very similar methods devoted to original, new, and experimental work in other engineering fields was warranted by the country's need for constructive research, the study of its supplies of untouched raw materials, and the developmnet and education of engineers.

"Every engineer who is interested in the advancement of his profession and in the welfare of the country will do well to follow the details and progress of this bill and lend it such support or constructive criticism as is possible." (Extract from the Mining Congress Convention paper of Dr. W. R. Whitney.)

Personals

M. M. Valerius and V. H. McNutt have returned to Tulsa after a six weeks' business visit to the East.

C. T. Griswold, of the Associated Geological Engineers, is in Wyoming, and Ernest Marquardt, of the same organization, is in Kansas.

Van H. Manning, director of the Bureau of Mines, was in New York the latter part of November consulting with John Hays Hammond and John L. Ricketts with regard to the smelter smoke problem at Anaconda. Dr. J. K. Clements acted as director during Mr. Manning's absence.

Charles F. Willis, director of the Arizona Bureau of Mines, was in Washington following the Mining Congress Convention. Mr. Willis was in personal charge of the Arizona exhibit which was an interesting feature of the Chicago meeting.

E. P. Mathewson has resigned as manager of the production works of the Anaconda Copper Company to accept a position as general manager of the British American Nickel Corporation at Sudbury, Ontario. His headquarters will be at Toronto.

S. A. Taylor, of Pittsburgh, Pa., was a caller at the Washington office of the American Mining Congress, on Monday, November 21.

SAFETY AND COMPENSATION ADD TO COAL PRICE

"The increased safety in the coal mines that has come through the combined efforts of the coal companies, the State inspectors, and the Federal Bureau of Mines necessarily involves some increase in cost of operation, but the few cents per ton thus added to the cost is a small price to pay for the satisfaction of having the stain of blood removed from the coal we buy. That form of social insurance which is now enforced through the workman's compensation laws alone adds from 2 to 5 cents a ton to the cost of coal." (Extract from the address of Geo. Otis Smith at the Mining Congress Convention.)

"The prospector is the product and child of the American Mining Law. If he is a desirable one, it will be well worth while to ascertain what there is in the law that has produced him, and keeps him with us." (Extract from address of F. W. Van Wagenen, at the Mining Congress Convention.)

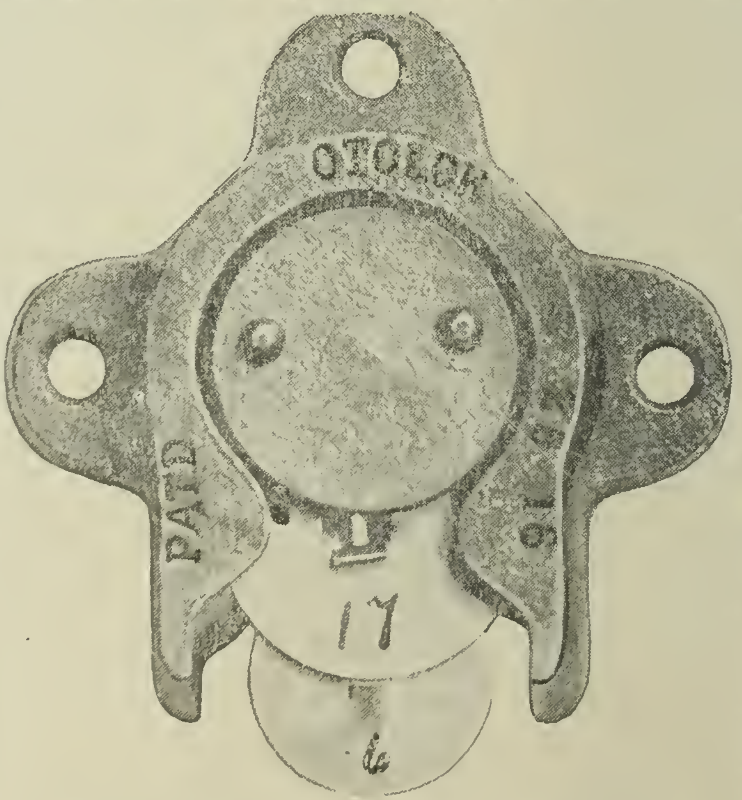
RADIUM IS FOUND IN TWO TYPES OF MINERALS

Radium is found in two principal types of minerals. As pitchblende, occurring only in granitic rocks, and in the oxidized minerals which have been formed probably from the breaking down of pitchblende and have been carried to other places in solution. The principal mineral of the oxidized group is carnotite, the yellow and generally powdery mineral which is found in considerable quantities in southwestern Colorado and southeastern Utah.

Other oxidized minerals, such as torbernite and autunite are found in the veins which carry pitchblende or in the oxidized portions of those veins which are thought to have contained pitchblende at one time. They are of little commercial value, although they have been mined as a source of radium in Portugal and South Australia.

MUST MAKE PUBLIC REALIZE IMPORTANCE OF MINING

"One of the most important lessons for the people of the United States, as the late Dr. Holmes pointed out, is to realize the importance of the mining industry; and a means of teaching them some part of this lesson has been found in the publication of dividends paid by the principal mining companies." (Extract from address of C. A. Tupper, at the Mining Congress Convention.)



How Otolok Stops the "Scraps"

OTOLOK is a registered letter, a certified check and a gilt edge insurance policy all in one.

It sends the loaded car from the coal face to the tipple, through half a dozen hands with the original check securely *locked* in place so it can not possibly be tampered with.

All check squabbles are stopped, the moment OTOLOK is fixed in place. It is easy, cheap and absolutely fool-and-crook-proof.

Write us for full information.

THE MINES OTOLOK CO.
House Building Pittsburgh, Pa.

TN
1
M6
v.2

Mining congress journal

~~Physical &~~
~~Applied Sci~~
~~Serials~~

Engineering

PLEASE DO NOT REMOVE
CARDS OR SLIPS FROM THIS POCKET

UNIVERSITY OF TORONTO LIBRARY

ENGIN STORAGE